



FXi 60, FXi 250 EXCITERS

Instruction Manual

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FXi 60, FXi 250 EXCITERS

Instruction Manual

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RF PRODUCT TECHNICAL ASSISTANCE, REPAIR SERVICE, PARTS -

Technical assistance is available from Broadcast Electronics by letter, prepaid telephone or E-mail. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured, and well protected. If proper shipping materials are not available, contact the RF Technical Services Department for a shipping container. Do not mail the equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact the RF Technical Services Department for a Return Authorization.

Emergency and warranty replacement parts may be ordered from the following address. Be sure to include the equipment model number, serial number, part description, and part number. Non-emergency replacement parts may be ordered directly from the Broadcast Electronics stock room at the number shown below.

RF TECHNICAL SERVICES -

Telephone: +1 (217) 224-9617

E-Mail: rfservice@bdcast.com

Fax: +1 (217) 224-6258

FACILITY CONTACTS -

Broadcast Electronics, Quincy Facility

4100 N. 24th St. P.O. BOX 3606

Quincy, Illinois 62305

Telephone: +1 (217) 224-9600

Fax: +1 (217) 224-6258

General E-Mail: bdcast@bdcast.com

Web Site: www.bdcast.com

PARTS -

Telephone: +1 (217) 224-9617

E-Mail: parts@bdcast.com



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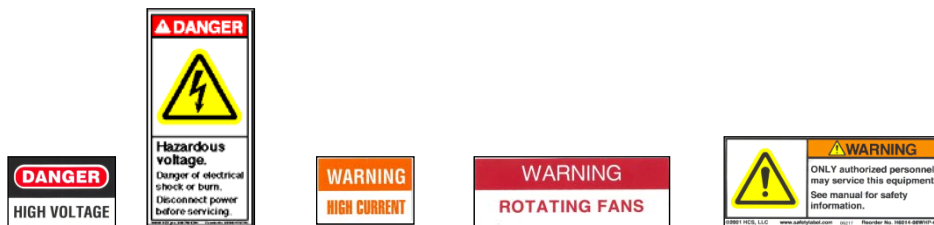




SAFETY PRECAUTIONS

PLEASE READ AND OBSERVE ALL SAFETY PRECAUTIONS//

ALL PERSONS WHO WORK WITH OR ARE EXPOSED TO POWER TUBES, POWER TRANSISTORS, OR EQUIPMENT WHICH UTILIZES SUCH DEVICES MUST TAKE PRECAUTIONS TO PROTECT THEMSELVES AGAINST POSSIBLE SERIOUS BODILY INJURY. EXERCISE EXTREME CARE AROUND SUCH PRODUCTS. UNINFORMED OR CARELESS OPERATION OF THESE DEVICES CAN RESULT IN POOR PERFORMANCE, DAMAGE TO THE DEVICE OR PROPERTY, SERIOUS BODILY INJURY, AND POSSIBLY DEATH.



DANGEROUS HAZARDS EXIST IN THE OPERATION OF POWER TUBES AND POWER TRANSISTORS -

The operation of power tubes and power transistors involves one or more of the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel.

- A. HIGH VOLTAGE** Normal operating voltages can be deadly. Additional information follows.
- B. RF RADIATION** Exposure to RF radiation may cause serious bodily injury possibly resulting in Blindness or death. Cardiac pacemakers may be affected. Additional information follows.
- C. HOT SURFACES** Surfaces of air-cooled radiators and other parts of tubes can reach temperatures of several hundred degrees centigrade and cause serious burns if touched. Additional information follows.
- D. RF BURNS** Circuit boards with RF power transistors contain high RF potentials. Do not operate an RF power module with the cover removed.

HIGH VOLTAGE –

Many power circuits operate at voltages high enough to kill through electrocution. Personnel should always break the primary AC Power when accessing the inside of the IPA unit.

RADIO FREQUENCY RADIATION

Exposure of personnel to RF radiation should be minimized, personnel should not be permitted in the vicinity of open energized RF generating circuits, or RF transmission systems (waveguides, cables, connectors, etc.), or energized antennas. It is generally accepted that exposure to “high levels” of radiation can result in severe bodily injury including blindness. Cardiac pacemakers may be affected.

The effect of prolonged exposure to “low level” RF radiation continues to be a subject of investigation and controversy. It is generally agreed that prolonged exposure of personnel to RF radiation should be limited to an absolute minimum. It is also generally agreed that exposure should be reduced in working areas where personnel heat load is above normal. A 10 mW/cm² per one tenth hour average level has been adopted by several U.S. Government agencies including the Occupational Safety and Health Administration (OSHA) as the standard protection guide for employee work environments. An even stricter standard is recommended by the American National Standards Institute which recommends a 1.0 mW/cm² per one tenth hour average level exposure between 30 Hz and 300 MHz as the standard employee protection guide (ANSI C95.1-1982).

RF energy must be contained properly by shielding and transmission lines. All input and output RF connections, such as cables, flanges and gaskets must be RF leak proof. Never operate a power tube without a properly matched RF energy absorbing load attached. Never look into or expose any part of the body to an antenna or open RF generating tube or circuit or RF transmission system while energized. Monitor the tube and RF system for RF radiation leakage at regular intervals and after servicing.

HOT SURFACES –

The power components in the IPA unit are cooled by forced-air and natural convection. When handling any components of the IPA unit after it has been in operation, caution must always be taken to ensure that the component is cool enough to handle without injury.



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1 OVERVIEW

Information presented by this section provides a description of the FXi digital FM/IBOC exciter features and lists equipment specifications.

1.1 EQUIPMENT DESCRIPTION.

The Broadcast Electronics FXi-60 and FXi-250 are state-of-the-art solid-state wideband FM/IBOC digital exciters providing a continuously variable RF output at any frequency within the 87.5 to 108 MHz FM broadcast band in 10 kHz increments (see Figure 1-1). The FXi is designed to operate as an FM exciter or be connected to a Broadcast Electronics IBOC (In-Band-On-Channel) signal generator for IBOC broadcast solutions. The exciter has many features including:

- **IBOC Compatible.** With the installation of a plug-in Exgine board and the connection of an XPi-10/XPi-10 esp Signal Exporter, the FXi exciter will transmit an IBOC signal for digital broadcasting applications. Operational modes include: 1) FM only, 2) IBOC only, and 3) FM and IBOC.
- **DTC (Direct-To-Channel).** The exciter uses DSP technology to generate an RF carrier on-channel. The unit is not equipped with a conventional analog RF up-converter stage.
- **Digital/Analog/Composite Audio Inputs.** The FXi audio inputs include: 1) AES/EBU wire, 2) AES/EBU optical, 3) left and right analog, and 4) composite. These inputs provide the interfacing required for almost any installation application.
- **SCA/RBDS – Internal And External.** The FXi is equipped with two internal SCA generators and one RBS/RBDS generator. The operating frequency, deviation, level, and pre-emphasis from each generator can be programmed from the user interface. The exciter is also equipped with an input for an external RF SCA/RBDS input for external SCA/RBDS applications.
- **Color Graphical User Interface.** A color graphical interface is used to program and operate the exciter. The interface is user-friendly and provides programming screens, operating data, and troubleshooting information. Data is entered into the interface using 11 front-panel soft-keys.
- **Compressor/Limiter.** The FXi is equipped with an internal compressor and limiter. The compressor can be programmed to provide specific attack times, release times, and threshold of operation. The limiter can also be programmed for a specific threshold of operation. These features allow the user to configure the exciter to provide the desired compression and limiting to prevent over-modulation conditions.
- **Security.** The FXi is equipped with a login system. This prevents unauthorized access to programming and set-up commands.
- **Automatic Switching To Backup Source.** The FXi is equipped with the ability to switch to a backup audio source in the event of a failure in the primary audio source. Primary audio source options include AES/EBU, composite, and analog left/right. Backup audio source options include AES/ EBU, composite, analog left/right, and none. This allows the FXi to maintain on-air operation during failure periods. In addition, the FXi allows the switch time for switching back to primary from secondary to be set from 1 second up to 120 seconds via the serial port on the rear of unit.

The FXi circuitry is divided into several assemblies. The assemblies include: 1) a DTC DSP digital exciter circuit board, 2) a controller circuit board, 3) a 60 or 250 watt RF power amplifier module, 5) a power supply circuit board, 6) an oscillator/filter circuit board, and 7) a front-panel switch circuit board.





Figure 1-1. FXi-60 DIGITAL EXCITER

1.1.1 DTC DSP DIGITAL EXCITER.

The signal processing section of the FXi exciter circuitry is housed on the DSP circuit board. All the exciter audio inputs are routed to the DSP (Digital-Signal-Processor) circuit board. These inputs include: 1) AES/EBU, 2) analog left/right, 3) composite, and 4) SCA audio for use with the internal SCA generators. In addition, the DSP circuit board is equipped with an RF SCA/RBDS receptacle. This input allows a signal from an external SCA/RBDS generator to be used. The entire conversion from audio to RF is accomplished using one DSP integrated circuit, one FPGA (Field-Programmable-Gate-Array), and one direct to channel converter stage.

1.1.2 AES/EBU.

AES/EBU is a serial digital audio data format standard used for the transfer of digital data between audio sources, consoles, and transmitting equipment (refer to Figure 1-2). The signal can be transmitted using RS-422 circuitry and a twisted pair conductor or an optical interface.

An AES/EBU signal can be one of two formats: 1) AES/EBU professional and 2) AES/EBU consumer. The FXi is designed with the AES/EBU professional format. The AES/EBU professional signal is constructed using a frame. Each frame consists of two sub-frames. The sub-frames contain digital information for 2 channels. Each sub-frame consists of: 1) a 4-bit synchronization preamble, 2) 4-bits of auxiliary data, 3) 20 bits of audio data, 4) a parity bit, 5) a validity bit, 6) a user bit, and 7) a channel status bit.

The AES/EBU signal must be uncompressed and can consist of several different sample rates. The rates range from 32 kHz to 96 kHz. A typical sample rate is 44.1 kHz. If compression such as MPEG is used at any location in the audio chain from the cut recording to the input to the exciter, deviation overshoot would occur if the signal were uncompressed and remained in the digital format. To preclude the overshoot, the exciter is equipped with a limiter circuit which removes the overshoot to maintain optimum audio signal quality.

1.1.3 RF AMPLIFIER MODULE.

The RF amplifier module is available in two configurations and designed to output a continuously variable RF output level. The configurations include a 60 watt module and a 250 watt module. Forward and reflected power samples are generated by a directional coupler circuit and routed to the controller circuit board for processing.

The RF output power level is controlled by the controller circuit board. Several samples from the RF amplifier module are routed to the controller for monitoring. These samples include forward power, reflected power, final 1 current, final 2 current, IPA current, driver current, and temperature. The controller automatically adjusts the output power level in response to high PA current, reflected power, and temperature conditions.

1.1.4 CONTROLLER CIRCUIT BOARD.

All FXi control and monitoring functions are performed by the controller circuit board. The controller performs the following functions:

1. Receives information from the user interface and programs the exciter operating frequency, frequency deviation, output power, and many other control functions.
2. Monitors and displays the status of system operating parameters consisting of system voltages, operating configurations, and power indications.
3. Performs automatic power control operations. The controller will automatically fold back power in response to high PA current, reflected power, and temperature conditions.
4. Mutes the exciter RF output.

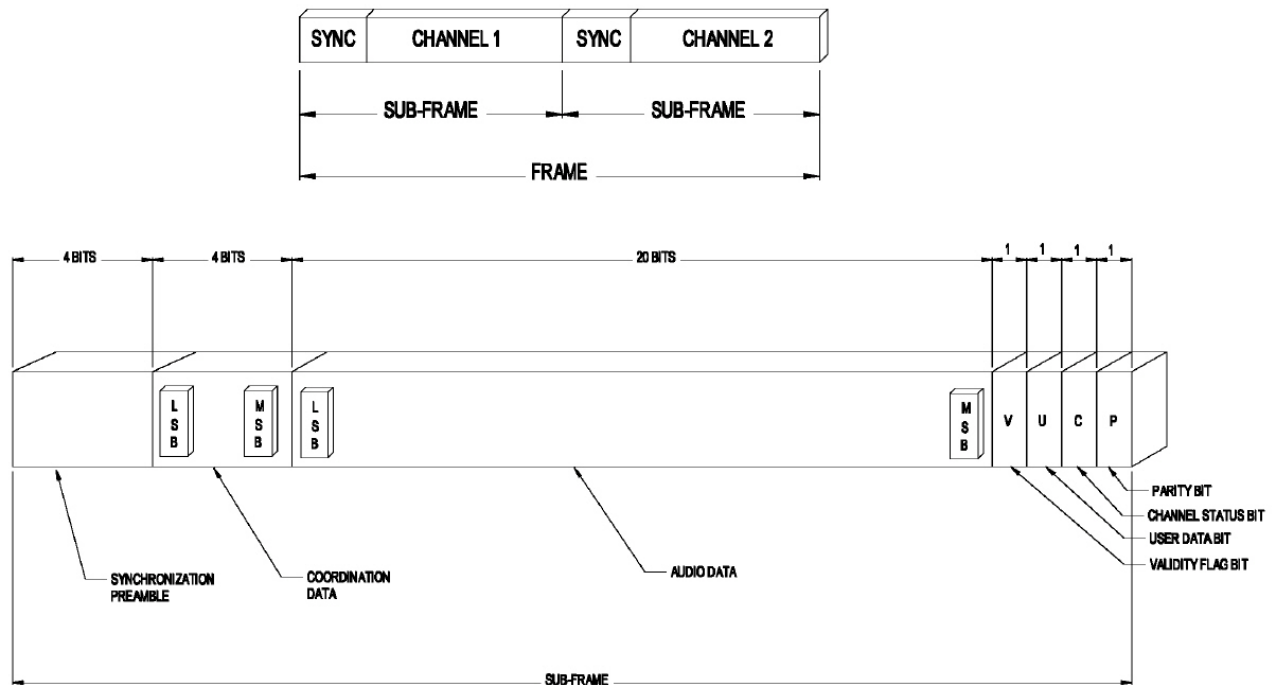


Figure 1-2. AES/EBU SIGNAL FORMAT

The controller circuit board is equipped with a Motorola Coldfire MCF5272 microprocessor. Data is entered into the user interface from 11 soft-keys. The controller circuit board also communicates with: 1) an optional N+1 circuit board allows the exciter to be automatically programmed for any one of 8 different frequencies and 2) an optional IBOC interface circuit board.

1.1.5 POWER SUPPLY CIRCUIT BOARD.

A power supply circuit board provides all dc voltages for the FXi circuitry. The circuit board operates from any ac voltage between 90 and 264 volts. A high/low ac line circuit protects the FXi circuitry from voltages above and below the 90/264 volt operating range. System dc operating voltages are generated by switching power supply circuitry.

1.1.6 PHYSICAL DESCRIPTION.

The FXi is housed in a chassis designed to be mounted in a 19 inch cabinet and requires 7 inches of vertical rack space. The power supply circuit board and the RF amplifier module are mounted in an area of the chassis designed for easy access. The optional N+1 and IBOC circuit boards are plug-in modules designed for ease of installation inside the unit.

1.2 APPLICATIONS.

The FXi is extremely versatile. The following text presents some typical FXi applications.

1.2.1 FM EXCITER.

The primary application for the FXi is an exciter in an FM broadcast transmitter. The FXi provides excellent audio performance and provides automatic switching to a backup source in the event of a failure in the main audio source.

1.2.2 IBOC DIGITAL BROADCASTING.

The FXi is completely IBOC compatible with the installation of the optional Exgine board and the FSI IBOC signal generator or the XPi-10/XPi-10 esp Signal Exporter. This provides an extremely flexible hardware format when converting the station to a digital broadcast signal. The design of the FXi allows the IBOC circuitry to be easily installed in an existing FXi installation. The Exgine board plugs directly into the DSP circuit board and connects to the 10 MHz reference on the DSP circuit board with a cable.

1.2.3 GPS SYNCHRONIZATION – BOOSTER SITES.

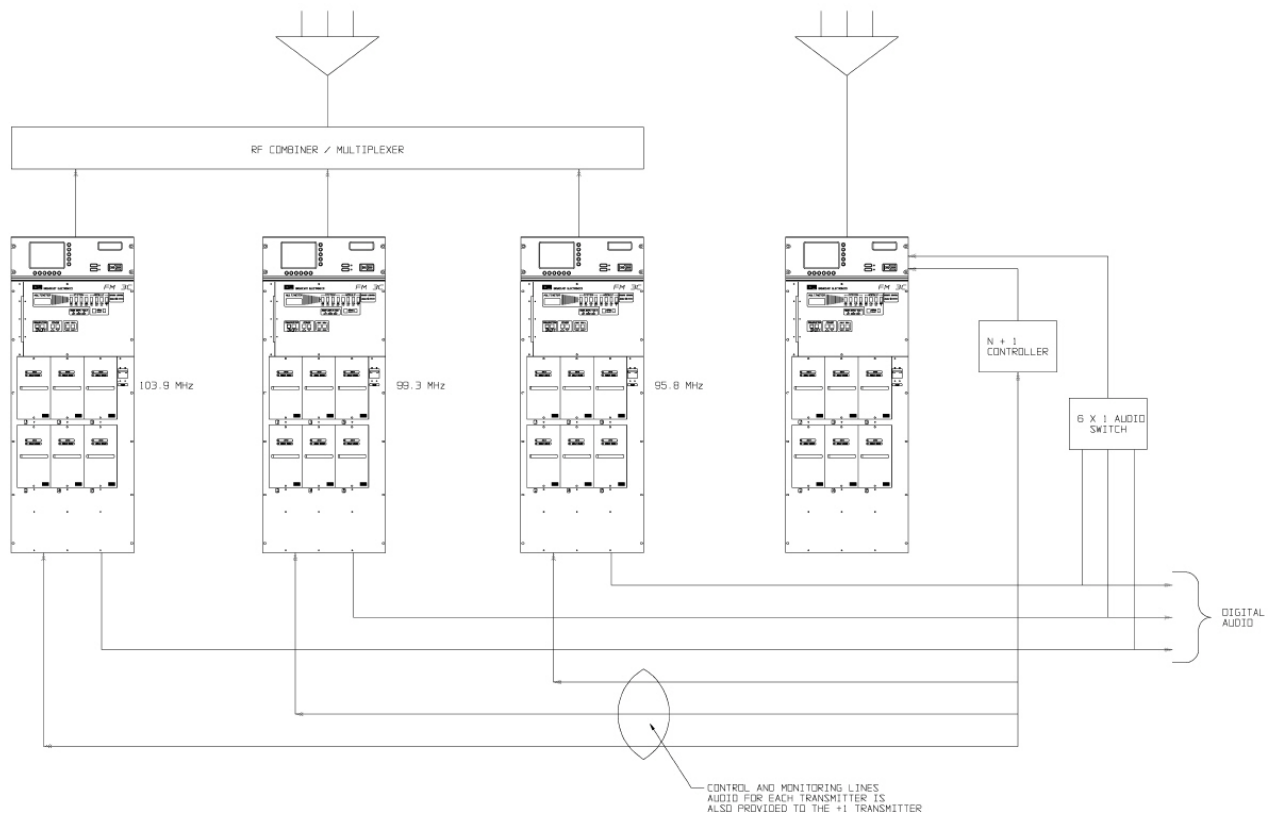
The FXi can be synchronized to an external reference such as the GPS (global position system) for booster sites. This allows a booster site to simulcast audio from the main transmitter on the same frequency. The exciter can be switched from the internal reference to an external GPS 10 MHz reference from the user interface.

1.2.4 N+1 OPERATION.

N+1 operation is the ability of an exciter or other device to switch to a number of predefined frequencies (refer to Figure 1-3). When the exciter is installed in a frequency agile transmitter, the transmitter can function as a backup to any one of several transmitters at a site.

This powerful function is provided by the FXi N+1 option. The option consists of a circuit board which attaches to the rear-panel and connects to the controller circuit board. When installed in a system with a Broadcast Electronics Solid-State C-Series or S-Series transmitter, the transmitter can be configured to any one of 8 different frequencies to provide emergency operation in the event of a failure in the main transmitter.





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Figure 1-3. N+1 TRANSMITTER SYSTEM

1.3 EXCITER CONFIGURATIONS, OPTIONS, AND ACCESSORIES.

The FXi digital exciter is available in several configurations. Refer to the following list for various digital exciter models, spare parts kits, and available options.

PART NO.	DESCRIPTION
909-9060	FXi-60 60 Watt FM Only Digital Exciter, 90V to 264V 50/60 Hz ac Operation.
979-0547-001	Kit, Upgrade, N+1 Option, FXi-60/250
909-0600	Exgine Field Upgrade Kit
909-9250	FXi-250 250 Watt FM Only Digital Exciter, 90V to 264V 50/60 Hz ac Operation.
979-0250-001	Kit, Spare Parts, FXi250
979-0060-001	Kit, Spare Parts, FXi60
979-0564	Pilot Sync Option
979-9250-001	FXi60 to FXi250 Field Upgrade Kit

1.4 EQUIPMENT SPECIFICATIONS.

Refer to Table 1-1 for electrical specifications and Table 1-2 for physical and environmental specifications of the FXi digital FM exciter.

Table 1-1. FXi DIGITAL EXCITER SPECIFICATIONS

PARAMETER	SPECIFICATIONS
GENERAL	
AC INPUT	90 to 264 Volts AC, 47 to 63 Hz, single phase.
RF OUTPUT IMPEDANCE	50 ohms.
RF POWER	
STABILITY	± 0.5 dB over frequency
ACCURACY	$\pm 10\%$ of set power over the operating range.
OUTPUT	
FXi-60	5 W to 60 W, continuously variable. Type-N female connector.
FXi-250	25 W to 250 W, continuously variable. Type-N female connector
VSWR	Rated power into 1.5:1 maximum without output matching. Open and short circuit protected at all phase angles.
FREQUENCY	
RANGE	87.5 MHz to 108 MHz digitally programmable in 10 kHz increments.
REFERENCE	
Internal Source Stability (TCXO)	10 MHz, ± 300 Hz, $+14^{\circ}\text{F}$ to $+122^{\circ}\text{F}$ (-10°C to $+50^{\circ}\text{C}$).
Internal Source Accuracy	± 40 Hz.
External Source	Can be locked to an external 10 MHz source such as GPS (global positioning system). Accuracy is dependent on the reference source.
AUDIO INPUTS	AES/EBU wire and optical, Left & Right analog, one balanced composite, one unbalanced composite, one SCA/RBDS/RDS external generator input, and 2 SCA audio inputs.
MODULATION TYPE	Direct-To-Channel digitally generated FM (no analog up conversion).



MODULATION CAPABILITY	75 kHz nominal. ± 300 kHz maximum. Adjustable from front panel.
MODULATION INDICATION	Digital peak reading, color-coded, LCD display with baseband over-modulation indicators. 2.5% accuracy on normal scale. 0.25% accuracy on 10% scale.
ASYNCHRONOUS AM SIGNAL-TO-NOISE RATIO	80 dB below an equivalent reference carrier with 100% amplitude modulation @ 400 Hz and 75 microsecond deemphasis (no FM modulation present). Unbalanced composite input.
SYNCHRONOUS AM SIGNAL-TO-NOISE RATIO	60 dB below an equivalent reference carrier with 100% amplitude modulation @ 400 Hz (FM modulation ± 75 kHz @ 400 Hz). Unbalanced composite input.
SPURIOUS AND HARMONIC	-80 dBc. Low-pass filter standard.
PRE-EMPHASIS	FCC 75 μ S, CCIR 50 μ S, or flat response, selectable.
POWER FACTOR	0.98 or greater
REGULATORY	FCC, DOC, CE, CCIR, IEC 215 Safety
COMPOSITE INPUT	
BALANCED INPUT	Balanced, BNC connector, Impedance – 10k ohm or 50 ohm, nominal, resistive, selectable.
UNBALANCED INPUT	Unbalanced, BNC connector. Impedance – 10k ohms
COMPOSITE INPUT LEVEL	3.5 Vp-p nominal for 100% modulation into 10k ohms. Range: 1 Vp-p to 4.0 Vp-p
COMPOSITE AMPLITUDE RESPONSE	± 0.25 dB, 30 Hz to 53 kHz.
COMPOSITE HARMONIC DISTORTION PLUS NOISE	0.005% at 400 Hz. 75 microsecond deemphasis.
COMPOSITE INTERMODULATION DISTORTION	0.03% or less
COMPOSITE FM SIGNAL-TO-NOISE RATIO	90 dB below 100% modulation @ 400 Hz. Measured in a 22 Hz to 22 kHz bandwidth, unweighted.
ANALOG LEFT/RIGHT INPUT	
INPUT LEVEL	+10 dBm nominal for 100% modulation into 600 ohms. Range: 0 dBm to +11 dBm.
IMPEDANCE	10k or 600 ohm selectable, balanced, resistive.
CONNECTOR	XLR



AMPLITUDE RESPONSE	± 0.5 dB, 20 Hz to 15 kHz. Flat, 50 microsecond, or 75 microsecond pre-emphasis.
FM STEREO HARMONIC DISTORTION PLUS NOISE	0.03% or less, 30 Hz to 15 kHz
INTERMODULATION DISTORTION	0.03% or less
STEREO SIGNAL-TO-NOISE RATIO	80 dB below 100% modulation @ 400 Hz. Measured in a 22 Hz to 22 kHz bandwidth, 75 microsecond deemphasis, unweighted.
STEREO SEPARATION	65 dB or better from 20 Hz to 15 kHz. Left into right or right into left.
FM MONO SIGNAL-TO-NOISE RATIO	90 dB below 100% modulation @ 400 Hz. Measured in a 22 Hz to 22 kHz bandwidth, 75 microsecond deemphasis, unweighted.
FM MONO HARMONIC DISTORTION PLUS NOISE	0.005% or less at 400 Hz, 75 microsecond deemphasis.
<i>AES/EBU INPUT</i>	
INPUT LEVEL	-2 dBfs for 100% modulation. Up to 96 kHz, 16-24 bits (32, 44.1, or 48 kHz typical sample rates for AES/EBU devices). Range: 0 dBfs to -30 dBfs.
IMPEDANCE	110 ohms balanced.
CONNECTOR	Wire – XLR, Optical – Toshiba Toslink.
AMPLITUDE RESPONSE	± 0.5 dB, 30 Hz to 15 kHz.
FM STEREO HARMONIC DISTORTION PLUS NOISE	0.03% or less, 20 Hz to 15 kHz.
INTERMODULATION DISTORTION	0.03% or less.
FM STEREO SIGNAL-TO-NOISE RATIO	80 dB below 100% modulation @ 400 Hz. Measured in 22 Hz to 22 kHz bandwidth, 75 microsecond deemphasis, unweighted.
STEREO SEPARATION	70 dB or better from 20 Hz to 15 kHz. Right into left or left into right.
FM MONO SIGNAL-TO-NOISE RATIO	90 dB below 100% modulation @ 400 Hz. Measured in a 22 Hz to 22 kHz bandwidth, 75 microsecond deemphasis, unweighted.
FM MONO HARMONIC DISTORTION PLUS NOISE	0.05% or better from 20 Hz to 15 kHz.
<i>STEREO OPERATION</i>	
OPERATING MODES	Stereo



LINEAR CROSSTALK	70 dB below 100% modulation, Main to Sub and Sub to Main.
AUDIO OVERSHOOT	2 dB maximum.
PILOT STABILITY	± 0.3 Hz
38 kHz SUPPRESSION	80 dB below 100% modulation.
57 kHz / 76 kHz / 95 kHz SUPPRESSION	80 dB below 100% modulation.
<i>MONAURAL OPERATION</i>	
OPERATING MODES	Mono L+R, Left Only, and Right Only
<i>SCA 1 AND 2 OPERATION – INTERNAL</i>	
INPUT LEVEL	+10 dBm nominal for 10% deviation into 600 ohms. Range: 0 dBm to +11 dBm.
INPUT IMPEDANCE	10k ohms or 600 ohms, selectable, balanced.
CONNECTOR	D-Connector, 9-Pin.
AMPLITUDE RESPONSE	± 0.5 dB, 20 kHz to 7.5 kHz.
SIGNAL-TO-NOISE RATIO	55 Db or greater.
HARMONIC DISTORTION PLUS NOISE	0.3% or less, 20 Hz to 7.5 kHz.
FREQUENCY	20 kHz to 99 kHz, software programmable.
DEVIATION	2.5 kHz to 10 kHz, software programmable.
INJECTION LEVEL	2% to 15%, software programmable.
<i>RBDS/RDS OPERATION – INTERNAL</i>	
FREQUENCY	57 kHz.
INJECTION LEVEL	2% TO 15%, software programmable.
<i>SCA/RBDS – EXTERNAL INPUT</i>	
INPUT LEVEL	3.5 Vp-p nominal for 10% deviation. Range: 1 Vp-p to 4.0 Vp-p.
INPUT IMPEDANCE	50 ohms, unbalanced.
CONNECTOR	BNC
FREQUENCY	57 kHz to 92 kHz



AMPLITUDE RESPONSE	± 0.5 dB, 53 kHz to 100 kHz
19 kHz OUTPUT	19 kHz synchronization clock for external RBDS/RDS operation. 2.5 V p-p measured with a 50-ohm load impedance
<p style="text-align: center;">NOTE</p> <p>All specifications measured using the Broadcast Electronics FXi digital exciter, a Belar FMSA-1 Precision Digital FM stereo modulation analyzer, a Belar FMM-2 FM demodulator, and Audio Precision APWin software version 2.14.</p>	

Table 1-2. PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

PARAMETER	SPECIFICATION
<i>PHYSICAL</i>	
WEIGHT:	
PACKED	46 Pounds (20.8 kg).
UNPACKED	38 Pounds (17.2 kg).
DIMENSIONS:	
HEIGHT	7 Inches (17.78 cm).
WIDTH	19.00 Inches (48.3 cm).
DEPTH	22.5 Inches (57.2 cm).
AIRFLOW	Intake and exhaust thru rear of unit.
<i>ENVIRONMENTAL</i>	
AMBIENT OPERATING TEMPERATURE	+14°F to +122°F (–10°C to +50°C)
HUMIDITY	95% Maximum, Non-Condensing
ALTITUDE	0 to 10,000 Feet (3048 m) Above Sea Level.



2 INSTALLATION

This section contains information required for installation and preliminary checkout of the Broadcast Electronics FXi digital FM/IBOC exciter.

2.1 UNPACKING.

The equipment becomes the property of the customer when the equipment is delivered to the carrier. Carefully unpack the exciter. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged. Claims for damaged equipment must be promptly filed with the carrier or the carrier may not accept the claim.

The contents of the shipment should be as indicated on the packing list. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and Broadcast Electronics.

2.2 SHIPMENT – EXCITER RE-INSTALLATION.

When the exciter is purchased in a transmitter system, the exciter is removed for shipment. To re-install the exciter: 1) insert the exciter in the transmitter chassis, 2) secure the exciter with the hardware in the accessory kit, 3) connect the 25-pin D-type connector to REMOTE connector J3 on the exciter rear-panel, 4) connect the PA RF input cable to the exciter RF output receptacle, 5) connect the RF Sample coax, if used, and ground connection, and 5) connect the ac line cord to the ac input receptacle. Note that other connections on the rear of the FXi are required for external connections. Refer to Appendix A for detailed instructions on installing the exciter into a specific type of transmitter.

2.3 INSTALLATION.

Each exciter is assembled, operated, tested, and inspected at the factory prior to shipment and is ready for installation when received. Prior to installation, this publication should be studied to obtain a thorough understanding of the operation, circuitry, nomenclature, and installation requirements.

2.4 ENVIRONMENTAL CONSIDERATIONS.

Table 1-2 provides physical and environmental conditions which should be considered prior to FXi digital exciter installation. Figure 2-1 presents the physical dimensions and installation data for the FXi exciter.

2.5 PLACEMENT.

The FXi may be installed in any convenient location in a 19 inch (48.3 cm) rack within reach of signal and power cables (refer to Figure 2-1). The unit requires 7 inches (17.78 cm) of vertical space in a 19 inch rack. The exciter should not be installed directly above or below heat generating equipment. If the unit is to be installed in an existing BEI transmitter, refer to Appendix A for placement and installation information. Once a rack location is determined, mount the chassis in the rack using 4 screws.



WARNING

ENSURE ALL PRIMARY POWER IS DISCONNECTED BEFORE PROCEEDING.

WARNING

2.6 CONNECTIONS.

AUDIO INPUT. The FXi is equipped with several audio inputs. Refer to the following text to connect audio to the desired FXi audio input.

AES/EBU. AES/EBU audio is interfaced to the AES/EBU connectors on the FXi rear-panel. The signal can be applied to the exciter using wire or fiber optic cable (refer to Figure 2-2). Refer to Figure 2-2 and connect the AES/EBU audio to the exciter as shown.

Analog Left/Right. Analog left/right audio is interfaced to LEFT/MONO and RIGHT XLR connectors on the FXi rear-panel. Refer to Figure 2-3 and connect analog left/right audio to the exciter as shown.

Composite. BAL COMP and UNBAL COMP BNC connectors are provided to interface composite audio to the FXi. Refer to Figure 2-4 and connect composite audio to the exciter as shown. Typically, the composite signal is connected to the UNBAL COMP connector. The BAL COMP connector is used if a ground loop problem is encountered.

SCA1 and SCA2 Audio For Internal SCA Generators. Audio for the internal SCA1 and SCA2 generators are interfaced to the exciter at the SCA AUDIO J19 connector (refer to Figure 2-5). Refer to Figure 2-5 and connect SCA audio to the exciter as shown.

External SCA Input. The SCA/RBDS BNC connector is provided to interface SCA information from an external SCA generator (refer to Figure 2-6). If an external SCA generator is to be used, refer to Figure 2-6 and connect the SCA signal to the SCA/RBDS connector as shown.

External RBDS/RDS Input. The SCA/RBDS BNC connector can also be used to interface RBDS/RDS information from an external RBDS/RDS generator (refer to Figure 2-6). The 19 kHz OUT connector provides the 19 kHz reference signal for the RBDS/RDS encoder unit. If an external RBDS/RDS generator is to be used, refer to Figure 2-6 and: 1) connect the 19 kHz OUT connector to the reference input of the RBDS/RDS encoder and 2) the output of the generator to the SCA/RBDS connector. An input level of 3.5V P-P (1.24 VRMS) will modulate the FM carrier at 10% modulation.

RF OUTPUT. The FXi is equipped with a Type - N RF output connector. Refer to Figure 2-1 and connect a coaxial cable between the RF OUTPUT connector on the exciter rear-panel and the transmitter RF input. For initial operation, connect the output of the exciter to a 50 Ohm load capable of dissipating the output of the exciter.



WARNING

**ENSURE THE EXCITER CHASSIS IS
CONNECTED TO EARTH GROUND.**

WARNING

GROUND. Refer to Figure 2-1. The FXi is equipped with a chassis ground terminal. Connect the terminal to earth ground using braided 18 gauge wire or a copper strap.

RF SAMPLE RECEPTACLE. Figure 2-1 presents the location of the RF sample receptacle. The receptacle is designed for the connection of a modulation monitor or test equipment. The receptacle will provide a zero dBm signal at 60 watts for 60 watt modules and a zero dBm signal at 250 watts for 250 watt modules. Connect the desired equipment to the receptacle as required.



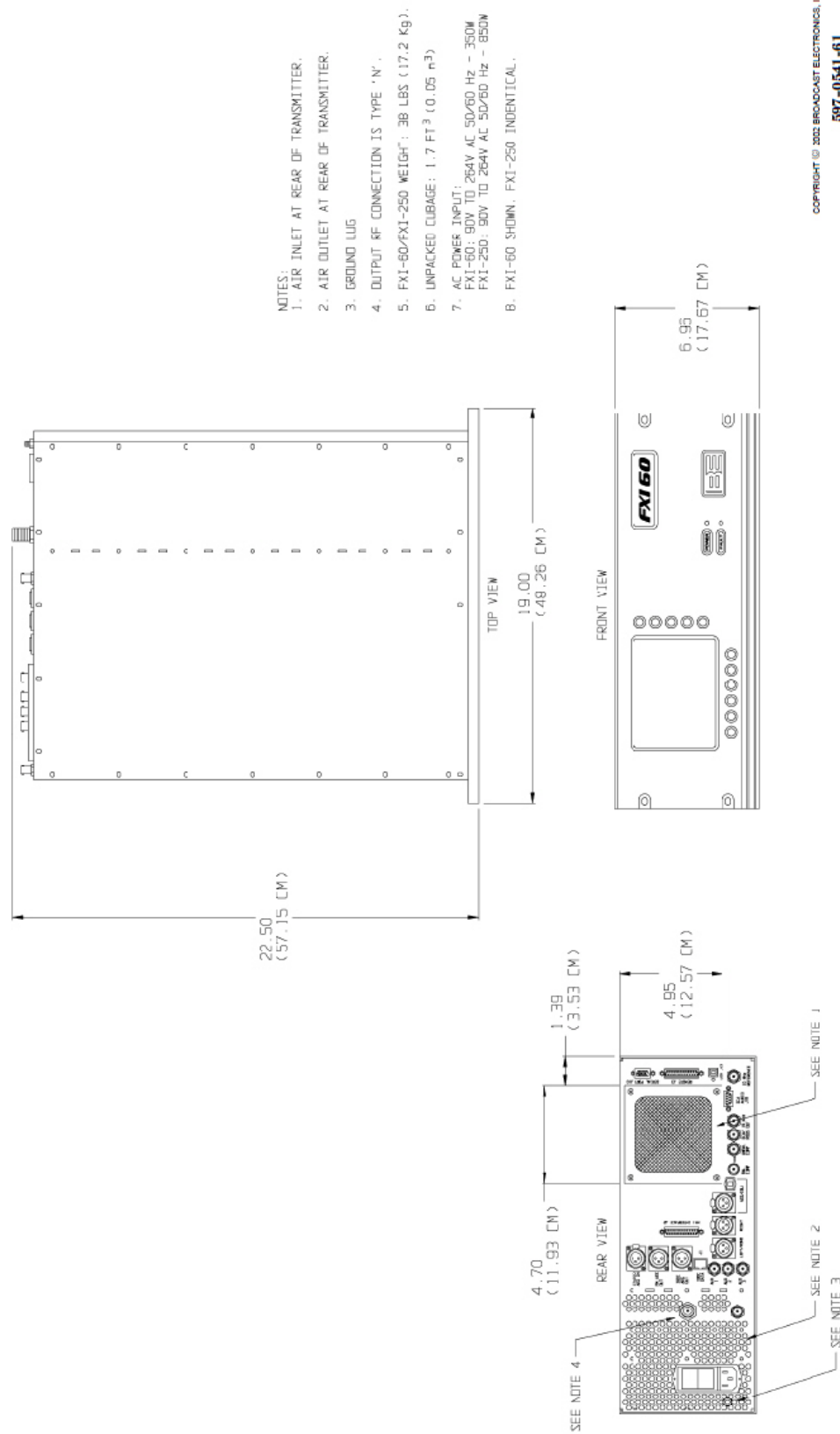


Figure 2-1. FXi INSTALLATION DIAGRAM

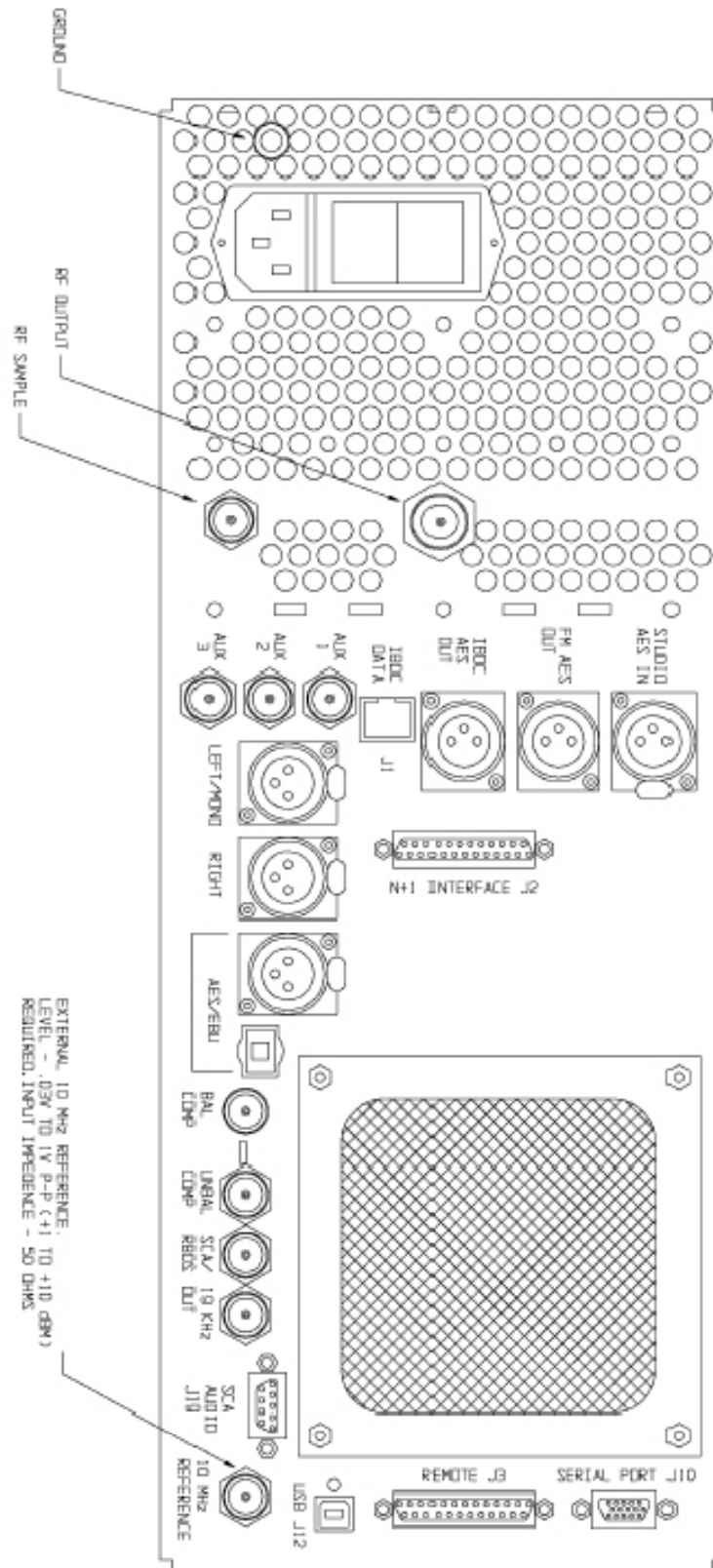


Figure 2-1. FXi INSTALLATION DIAGRAM

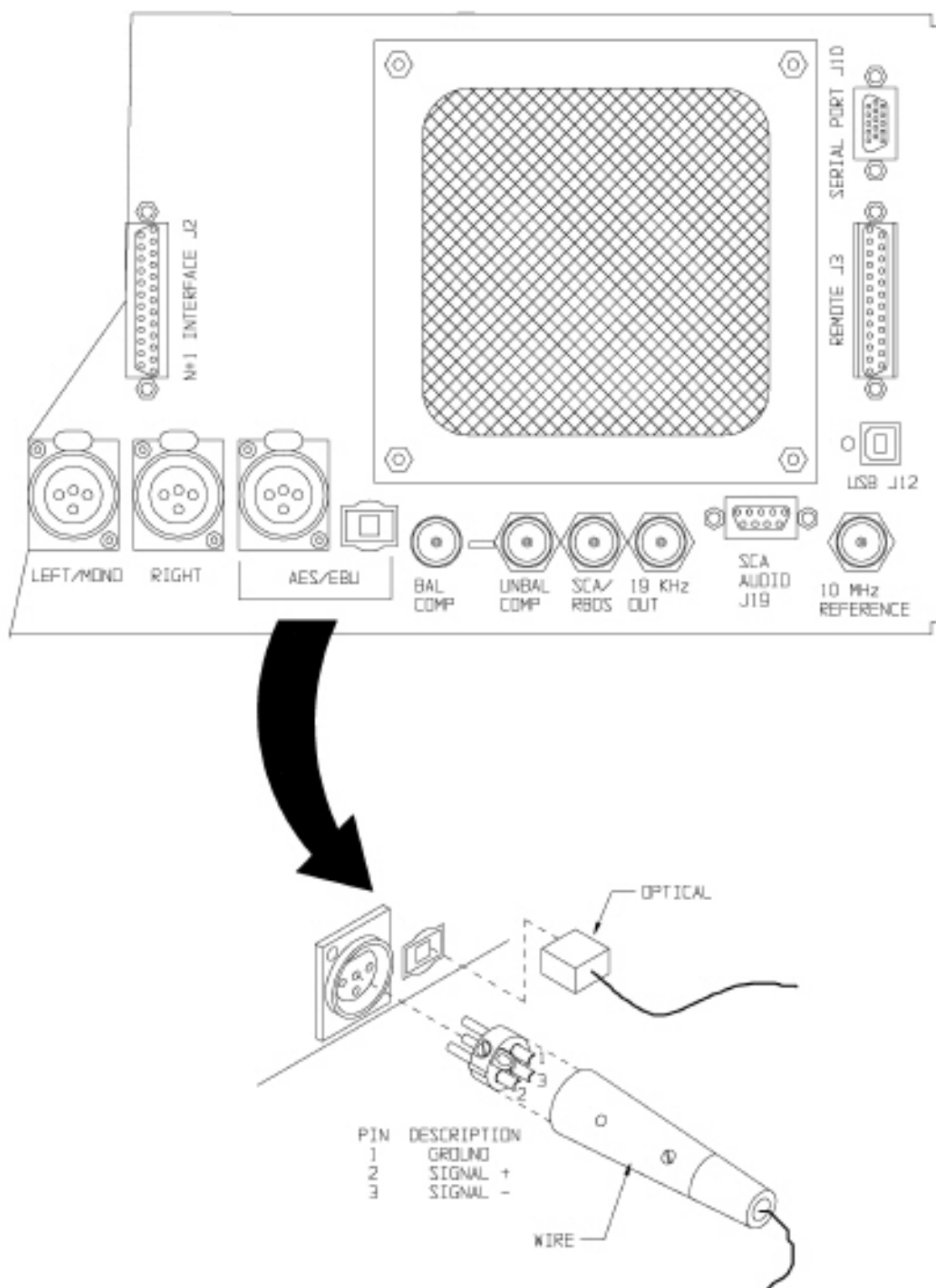


Figure 2-2. Fxi AES/EBU CONNECTIONS

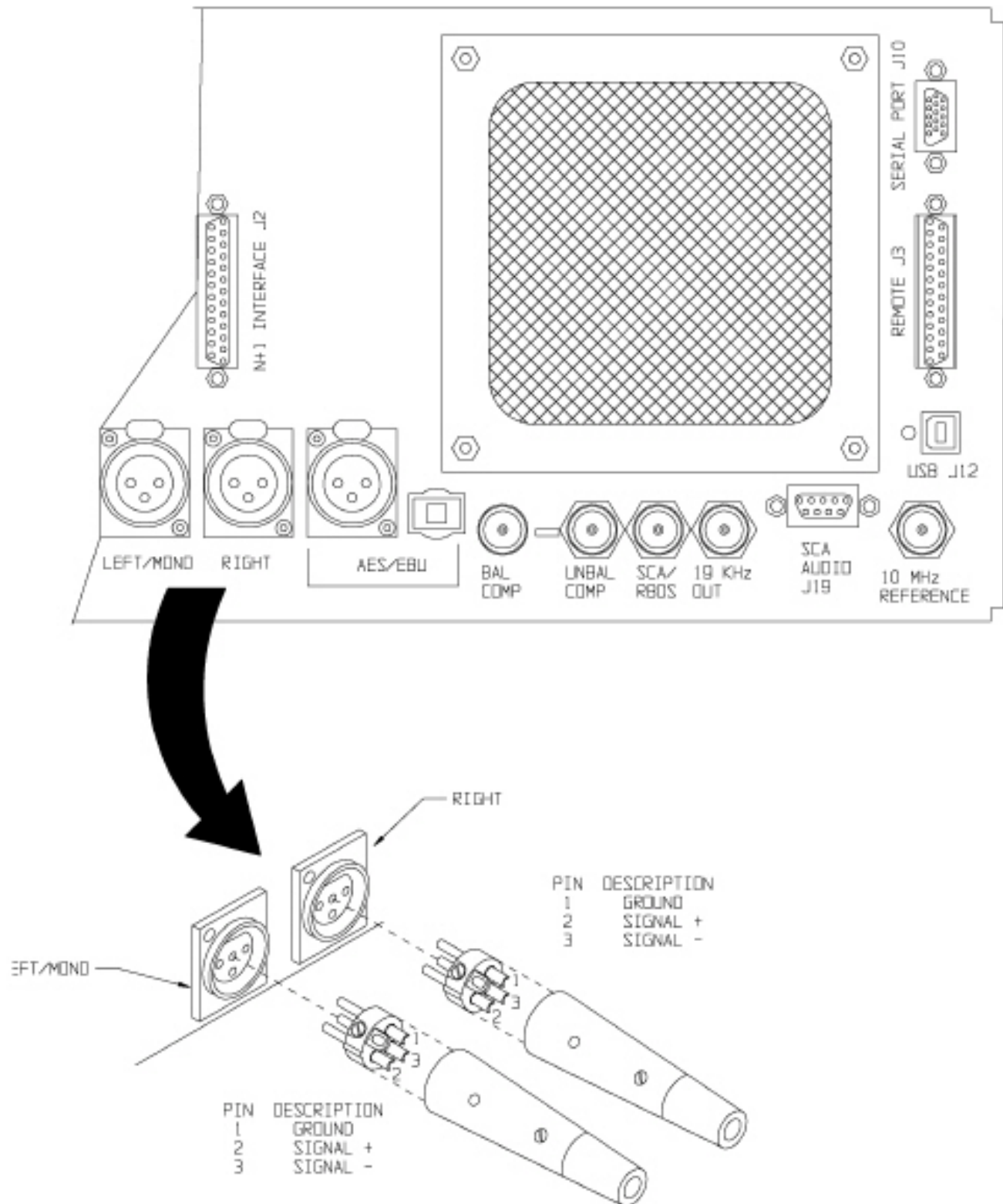


Figure 2-3. Fxi ANALOG LEFT/RIGHT CONNECTIONS

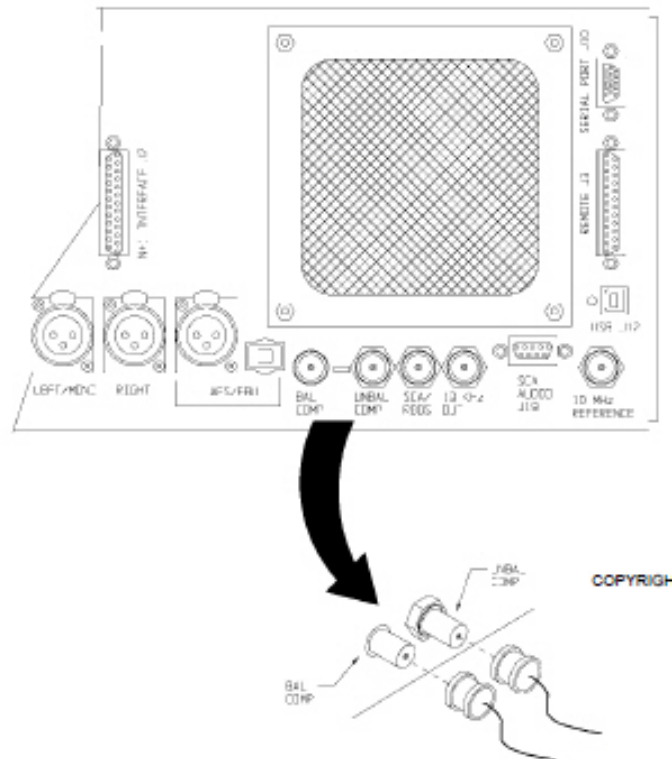


Figure 2-4. FXi COMPOSITE CONNECTIONS

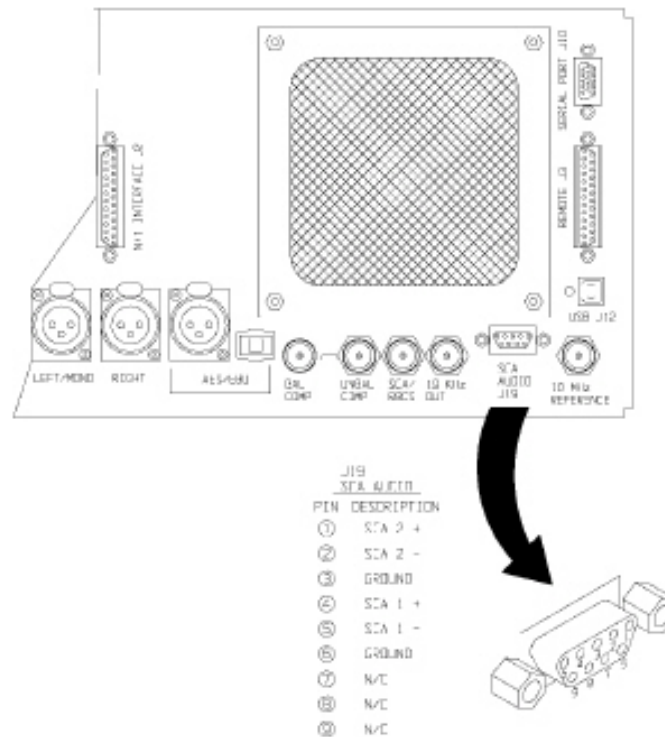


Figure 2-5. FXi INTERNAL SCA1/SCA2 AUDIO CONNECTIONS

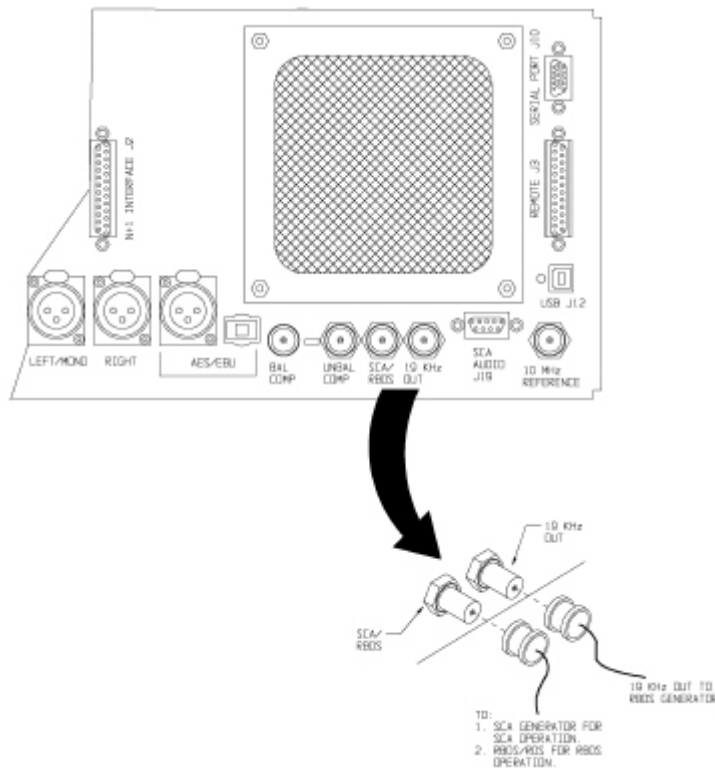


Figure 2-6. EXTERNAL SCA/RBDS CONNECTIONS

REMOTE CONTROL AND INDICATIONS. Refer to Figure 2-7. The FXi is designed for remote control/indication operation. Remote control interfacing is provided at 25-pin D-type connector REMOTE J3 on the exciter rear-panel. J3 pin out information is screened on the rear panel of the FXi. Some older FXi chassis may have outdated silk screens of REMOTE functions. Refer to Figure 2-7. The exciter will interface with almost any remote control unit or panel.

The following text presents a description of the remote control and indicator functions.

AFC Relay. An AFC (automatic frequency control) relay is provided to connect to a transmitter AFC input or control equipment external to the unit. When the FXi is used as an exciter in a transmitter system, the relay connects to the transmitter controller AFC input. When the FXi is operating as an independent unit, the relay can be used to control an external alarm. The relay contacts are rated at 125V @ 0.5 ampere and are accessible at REMOTE J3-1 through J3-3. When an AFC fault occurs, the relay will open. For Broadcast Electronics C-Series, S-Series, and T-Series transmitters, connect the AFC control line to the normally open terminal. Connect a ground to the common terminal. The relay is active unless any of the following conditions occur.

1. When a power supply fault occurs.
2. When the PLL circuitry on the DSP board is not locked.

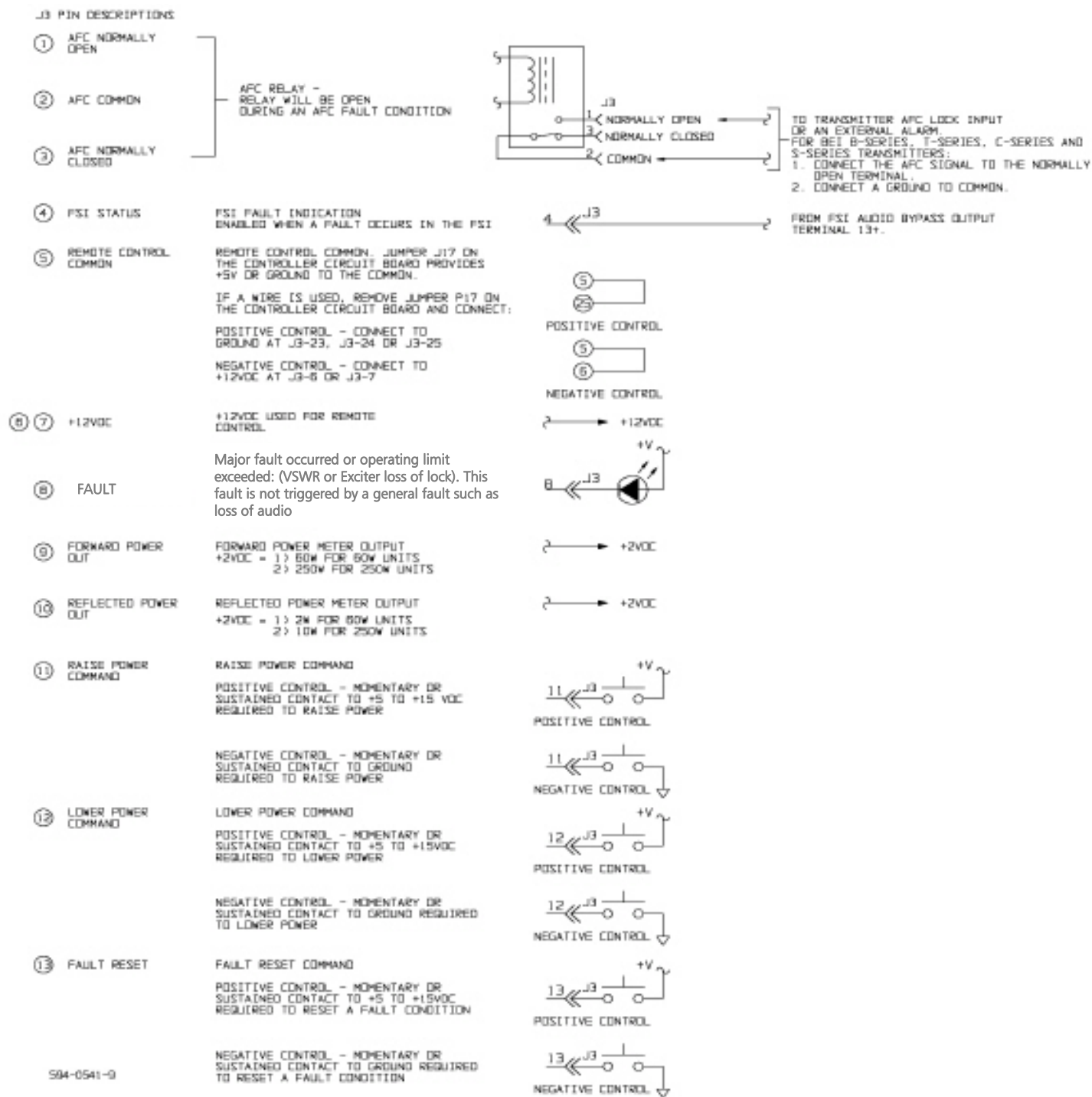
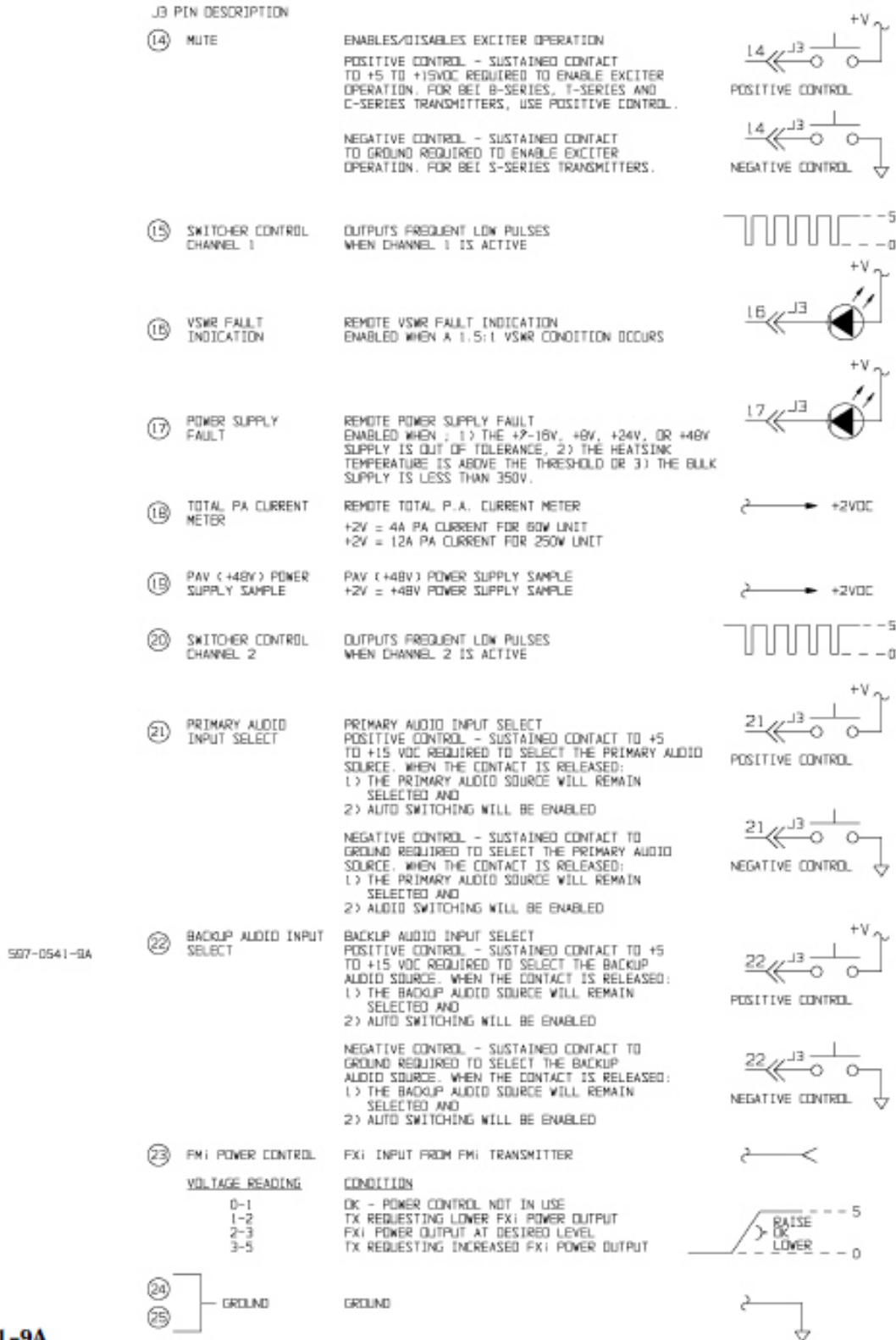


Figure 2-7. REMOTE CONTROL INTERFACING
(SHEET 1 OF 3)



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Figure 2-7. REMOTE CONTROL INTERFACING
(SHEET 2 OF 3)



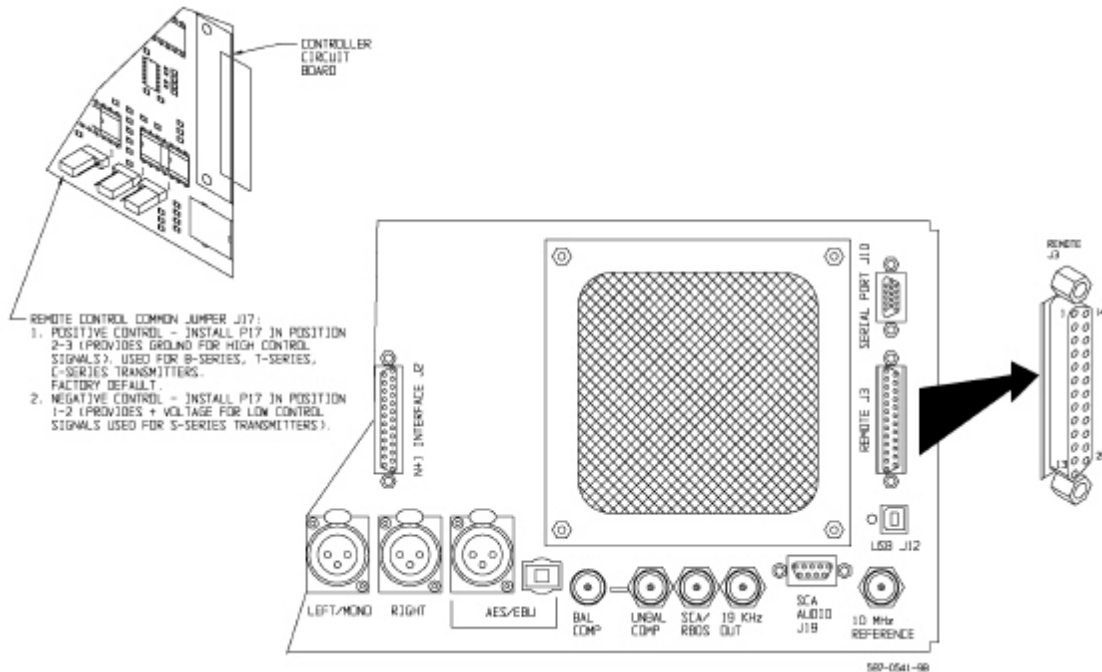


Figure 2-7. REMOTE CONTROL INTERFACING
(SHEET 3 OF 3)

SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL. Refer to Figure 2-7. Jumper J17 on the controller circuit board (mounted on the left wall of the exciter chassis) provides the appropriate common for positive or negative remote control operation. The factory default is position 2-3, which provides a ground to the common. This configures remote control operation for positive control (voltage required to activate a command). Position 1-2 provides +5V to the common. This is for negative remote control operation (uses a ground to activate a command). If the jumper is installed, do not connect any wires to the common at J3-5.

If wire is to be connected at J3-5, remove P17. Connect the common to J3-25 (ground) for positive control. Connect the common to J3-6 (+12V) for negative control.

+12V. +12V dc (100 mA max) is located at J3-6 and J3-7. The +12V dc is used for remote control and indicator connections.

Temperature Fault Indicator. The remote temperature fault indicator provides a signal to indicate when the RF amplifier heat sink temperature exceeds the threshold. The temperature fault indicator is located at J3-8. The indicator will be enabled (logic Low) to indicate the presence of an RF amplifier heat sink temperature fault condition.

Remote Forward Power Meter Indications. The remote forward power meter indications are located at J3-9. This forward power output will be 2 volts for a FXi 60 at 60W output. The FXi 250 will output 4 volts at 250W output when TX type is selected as T-Series and 4 volts for all other types. This voltage will change in a logarithmic fashion when the TX type is selected as a T-Series and linearly for all other types for both the FXi 60 and 250.

Remote Reflected Power Meter Indications. The remote reflected power meter indications are located at J3-10. The reflected power meter indication will output a +2 volt dc signal when the reflected power is 3 watts for 60 watt units or 12 watts for 250 watt units.

Raise Power Level Control. The raise power level control is located at J3-11. The function can be activated using positive or negative control. Positive control requires the use of a momentary or sustained contact to a +5 volt to +15 volt dc signal to raise the FXi power level. Negative control requires the use of a momentary or sustained contact to ground to raise the FXi power level. Also refer to SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL above.

Lower Power Level Control. The lower power level control is located at J3-12. The function can be activated using positive or negative control. Positive control requires the use of a momentary or sustained contact to a +5 volt to +15 volt dc signal to lower the FXi power level. Negative control requires the use of a momentary or sustained contact to ground to lower the FXi power level. Also refer to SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL above.

Fault Reset Control. The fault reset control is located at J3-13. The function can be activated using positive or negative control. Positive control requires the use of a momentary or sustained contact to a +5 volt to +15 volt dc signal to reset a fault condition. Negative control requires the use of a momentary or sustained contact to ground to reset a fault condition. Also refer to SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL above.

MUTE. The mute control input is used to enable/disable exciter operation. The control is located at J3-14. The control can be activated using positive or negative control. Positive control requires the use of a sustained contact to a +5 volt to +15 volt dc signal to enable exciter operation. Negative control requires the use of a sustained contact to ground to enable exciter operation. For BEI T-Series and C-Series transmitters, use positive control. For BEI S-Series transmitters, use negative control. Also refer to SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL above.

VSWR Fault Indicator. The remote VSWR fault indicator provides a signal to indicate when a 1.5: 1 or greater VSWR condition is present at the FXi RF power output. The VSWR fault indicator is located at J3-16. The indicator will be enabled (logic Low) to indicate the presence of a VSWR fault condition.

Power Supply Fault Indicator. The power supply fault indicator provides a signal to indicate when a power supply fault has occurred. The fault will be enabled when: 1) the $\pm 16V$, +8V, +24V, or +48V supply is out of tolerance, 2) the heat sink temperature is above the threshold, or 3) the bulk supply is less than 350V. The power supply fault indicator is located at J3-17.

Total PA Current Meter Indications. Total PA current meter indications are located at J3-18. The PA current meter will output a +2 volt dc signal when the PA current is 12 Amperes for 250W models or 4 Amperes for 60W models.

PAV (+48) Volt Power Supply Sample. A sample of the PAV (+48) volt power supply is located at J3-19. The supply sample will output a +2 volt dc signal when the PAV voltage is at +48 volts.

Remote Bypass Operation. For operation in IBOC mode the FXi has two outputs for controller external audio bypass equipment. Channel 1 is located at J3-15 and channel 2 is located at J3-20. If there are no major faults in the FXi or FSI/XPi 10 channel 1 will toggle high and low and channel 2 will be held high. If a major fault occurs in the FXi or FSI/XPi 10 channel 1 will be held high and channel 2 will toggle high and low.

Primary Audio Input Select Control. The primary audio input select control is located at J3-21. The function allows the primary audio source to be placed on-the-air. The function can be activated using positive or negative control. Positive control requires the use of a +5 volt to +15 volt dc signal to select the primary audio input source. Negative control requires the use of a contact to ground to select the primary audio input source. A sustained contact is required to select and maintain the primary audio source. When the contact is released: 1) the primary audio source will remain selected and 2) automatic switching will be enabled. For operation with remote control devices such as a Burk, use a latching relay to perform this task.



Backup Audio Input Select Control. The backup audio input select control is located at J3-22. The function allows the backup audio source to be placed on-the-air. The function can be activated using positive or negative control. Positive control requires the use of a +5 volt to +15 volt dc signal to select the backup audio input source. Negative control requires the use of a ground to select the backup audio input source. A sustained contact is required to select and maintain the backup audio source. When the contact is released: 1) the backup audio source will remain selected and 2) automatic switching will be enabled. For operation with remote control devices such as a Burk, use a latching relay to perform this task. Also refer to SELECTING POSITIVE OR NEGATIVE REMOTE CONTROL above.

Ground. Circuit ground located at J3-23 through J3-25. The ground is used for remote control and indicator connections.

FSI Status. The FSI status is located at J3-4 and is used only when the FXi is configured for IBOC operation. The input is enabled (logic Low) when a fault occurs in the FSI IBOC signal generator. The input connects to the audio bypass 13 + terminal on the FSI.

EXTERNAL 10 MHz INPUT. Refer to Figure 2-1. The FXi is equipped with an external 10 MHz REFERENCE input. The input is designed for the connection of a 10 MHz source such as from the output of a GPS receiver. If an external source is connected: 1) the source provides backup operation for the internal source and 2) allows the user to lock the unit to the external source. The input impedance is 50 Ohms. Ensure the source has a level between 0.3V to 1V peak-to-peak (+1 to +10 dBm).

USB PORT. The FXi is equipped with USB port J12. The port is provided for future use.

SERIAL PORT. The FXi is equipped with serial port J10. The port is used to enter RBDS/RDS data into the internal FXi generator. Refer to RBDS/RDS PROGRAMMING in SECTION III, OPERATION to enter data into the internal RBDS/RDS generator.

AC POWER CONNECTIONS.

The FXi is equipped with a switching power supply circuit board. The power supply automatically switches between 117V and 220V operation. AC line overload protection is provided by a built-in ac on/off/circuit breaker ac input module. Connect the FXi to any 90V to 264V 50/60 Hz ac power source.

2.7 INITIAL CHECKOUT.

Before proceeding, check the following:

1. Ensure the unit is connected to an approved power supply source.
2. Ensure the chassis ground connection is secure.
3. Ensure all signal inputs are secure.
4. Ensure the RF output is connected to a test load.
5. Ensure all external cabling is properly dressed and secured.
6. For standalone operation, ensure a mute jumper is connected between J3-14 (UNMUTE) and J3-6 (+12 Vdc) and that control board jumper 17 is set to 2-3 (Figure 2-7, sheet 3). For operation with a transmitter, ensure the mute signal from the transmitter controller is connected to J3-14. Ensure the FXi mute input is configured for the correct signal polarity.

To initially operate the exciter, perform the following procedure.

Refer to Figure 2-1. Operate the rear-panel on/off switch to on. With the unit programmed with the factory set operating modes, the following events will occur when ac power is applied to the unit.

1. The fan will begin to operate.
2. The LCD panel will illuminate.
3. The POWER indicator will illuminate.

Refer to Figure 2-8. No faults should be active. If EXCITER MUTE is active, recheck the steps in the Initial Checkout above.



2.8 INITIAL SETUP.

LOGIN.

Login procedures appear in the OPERATION section.

1. Depress LOGIN.
The LOGIN menu will appear.
2. Using the numeric keys, enter: 123456.
3. Depress ENTER. The user will be able to access all menus.

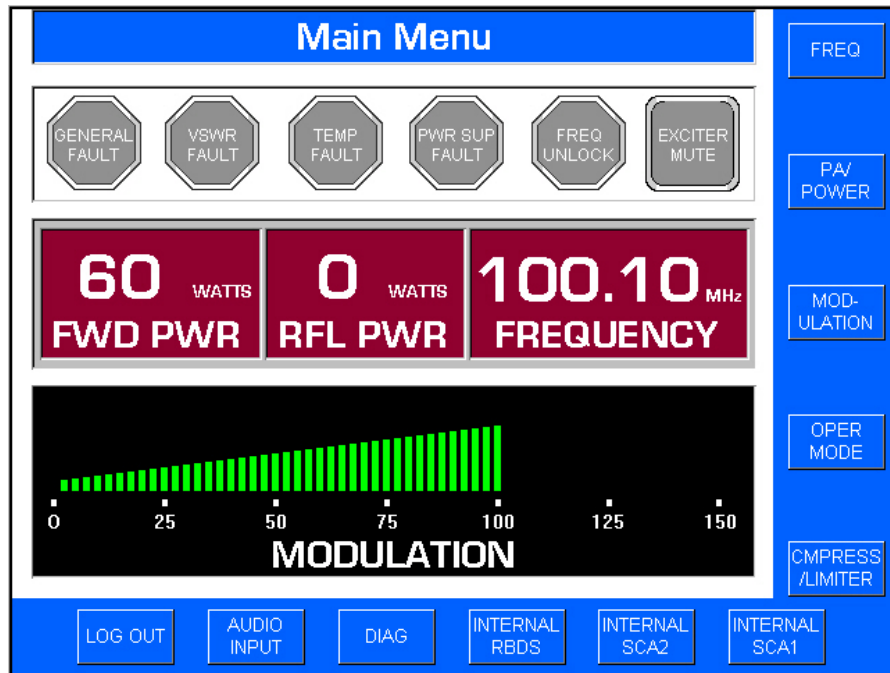


Figure 2-8. FXi MAIN MENU

2.9 INITIAL PROGRAMMING.

Several operating parameters such as the operating frequency, RF power output, and the modulation deviation must be programmed. Refer to the SECTION III, OPERATION and setup the following operating parameters.

- A. Operating frequency – Perform the CARRIER FREQUENCY PROGRAMMING procedure, Figure 3-4.
- B. RF output power – Perform the RAISE/LOWER procedure, Figure 3-41.
- C. Modulation – Perform the MODULATION PROGRAMMING procedure, Figure 3-7.
- D. Primary/Backup audio source – Perform the AUDIO INPUT – SETUP procedure, Figure 3-31.
- E. Stereo mode – Perform the STEREO MODE PROGRAMMING procedure, Figure 3-9.
- F. Pilot mode – Perform the PILOT PROGRAMMING procedure, Figure 3-10 .
- G. Compressor/limiter operation – Perform the COMPRESSOR/LIMITER PROGRAMMING procedure, Figure 3-12.
- H. SCA1 operation – Perform the INTERNAL SCA1 PROGRAMMING procedure, Figure 3-17.
- I. SCA2 operation – Perform the INTERNAL SCA 2 PROGRAMMING procedure, Figure 3-23.
- J. RBDS/RDS operation – Perform the INTERNAL RBDS/RDS PROGRAMMING procedure, Figure 3-29.
- K. External SCA/RBDS operation – Perform the EXTERNAL SCA/RBDS SETUP procedure, Figure 3-35.

2.10 INSTALLATION ADJUSTMENTS – CALIBRATION.



CAUTION

CAUTION

CALIBRATION CAN NOT BE PERFORMED DURING ON-AIR OPERATION. THE AUDIO SOURCE TO BE CALIBRATED WILL TEMPORARILY BE THE ACTIVE PRIMARY SOURCE DURING THE PROCESS.

The procedures to calibrate the FXi audio sources is presented in SECTION III, OPERATION. Refer to AUDIO INPUT - SETUP/SELECTION/CALIBRATION to setup and calibrate the FXi audio sources, Figure 3-31.

2.11 INSTALLATION ADJUSTMENTS – AUDIO FOR INTERNAL SCA.

Refer to Figure 2-5. The internal SCA generators require a nominal +10 dBm audio input level. The range is from 0 dBm to +11 dBm. Adjust the level of the external SCA audio source for a nominal +10 dBm level.

2.12 OPTIONAL EXGINE UPGRADE.

Installation and operating information for the optional Exgine circuit board is presented in the Exgine Upgrade Application Guide, 597-0545. Refer to document 597-0545 to install and operate the Exgine board.

2.13 INTERNAL RBDS/RDS DATA ENTRY.

Refer to Figure 2-5. Data is entered into the internal RBDS/RDS generator using rear panel SERIAL PORT J10. Refer to RBDS/RDS DATA ENTRY in SECTION III, OPERATION to enter data into the internal RBDS/RDS generator.

3 OPERATION

This section identifies all controls and indicators associated with the FXi digital FM/IBOC exciter and provides standard operating procedures.

3.1 CONTROLS AND INDICATORS.

Refer to Figure 3-1. FXi CONTROLS AND INDICATORS. for the location of all controls and indicators associated with normal operation of the FXi. The function of each control or indicator is described in Table 3-1.

Table 3-1. FXi CONTROLS AND INDICATORS

ITEM NO.	NOMENCLATURE	FUNCTION
1	POWER Indicator	Illuminates to indicate AC power is applied to the unit.
2	FAULT Indicator	Illuminates to indicate one or more of the following faults has occurred: 1) General, 2) VSWR, 3) Temperature, 4) Power Supply, or 5) Frequency Unlock
3	LCD Panel	This is the primary user interface for displaying internal conditions and for controlling operation. The adjacent soft-keys are the input for menus.
4	FXi Soft-Keys Buttons	The FXi is equipped with 11 front-panel soft-keys. Soft-keys are keys that change functionality with the type of menu being displayed on the LCD panel. The keys are part of a graphical interface that is used to program and operate the exciter. The buttons are labeled by the adjacent test.
5	On/Off Switch	A rear-panel switch controls AC power to the power supply.
6	Power Supply Diagnostic Indicators	Several LEDs indicate the status of power supply voltages. Refer to paragraph 5-26.

3.2 OPERATION.



NOTE THE FOLLOWING PROCEDURE ASSUMES THAT
THE EXCITER IS COMPLETELY INSTALLED
NOTE AND IS FREE OF ANY DISCREPANCIES.

3.2.1 TURN ON.

Operate the rear-panel ac On/Off switch to On. The following events will occur:

- A. The POWER indicator will illuminate.
- B. The main menu will appear (refer to Figure 3-2).



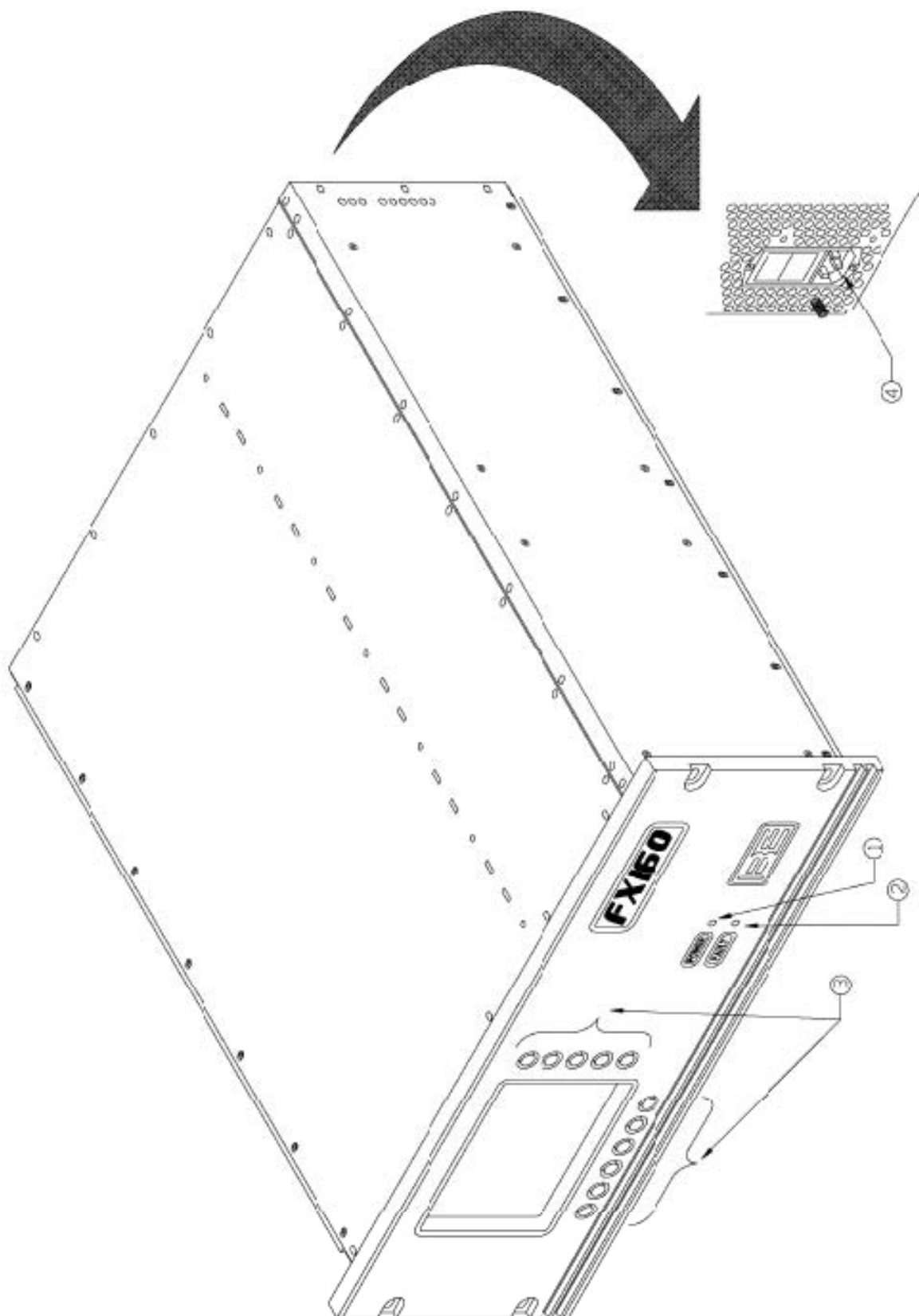


Figure 3-1. FXi CONTROLS AND INDICATORS

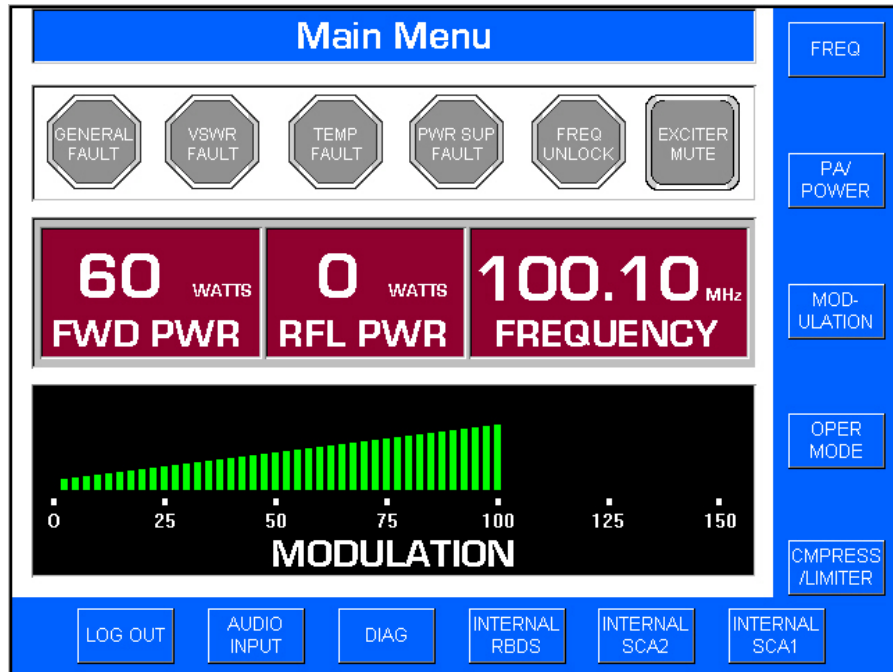


Figure 3-2. FXi MAIN MENU

3.3 FXi USER INTERFACE.

Refer to Figure 3-2. The FXi exciter is equipped with an intuitive graphical interface. The interface consists of several menus which allow the user to enter FXi programming data and view the status of the operating parameters. The following text presents information on each primary menu in the user interface.

Main Menu. The Main Menu presents the fault status, forward power, reflected power, carrier frequency, and modulation meter. The menu also allows access to the remaining FXi menus.

FREQ Menu. The Frequency Menu allows the entry of the exciter carrier frequency and the selection of the internal or an external 10 MHz reference. For optional N+ 1 system, the Freq Menu contains additional sub-menus for the programming and selection of up to 8 transmitter frequencies.

PA/POWER Menu. The PA/Power Menu allows the exciter forward power level to be changed. A forward power display presents the exciter forward power in watts. A reflected power display presents the reflected power in watts.

MODULATION Menu. The Modulation Menu allows the exciter deviation and pre-emphasis to be programmed. A custom deviation menu allows the deviation to be programmed from 50 kHz to 300 kHz.

OPER MODE Menu. The Stereo Menu programs the IBOC operating mode, stereo operating mode, and pilot level. The menu also allows the pilot to be enabled/disabled.

COMPRESS/LIMITER Menu. The exciter is equipped with a compressor and a limiter.

Both of these features are controlled by the Compressor/Limiter menu. The compressor allows the user to reduce peak modulation using a programmable threshold, attack time, and release time. The limiter will provide a hard limit during high modulation conditions and is programmed by a threshold parameter. Both the compressor and limiter can be enabled/disabled.

INTERNAL SCA1 Menu. Internal SCA1 setup parameters are presented by the Internal SCA1 menu. The menu controls parameters such as operating mode, frequency, deviation, injection level, and pre-emphasis.

INTERNAL SCA2 Menu. Internal SCA2 setup parameters are presented by the Internal SCA2 menu. The menu controls parameters such as operating mode, frequency, deviation, injection level, and pre-emphasis.

INTERNAL RBDS Menu. Internal RBDS/RDS setup parameters are presented by the Internal RBDS menu. The menu controls parameters such as operating mode and injection level.

DIAG Menu. The Diagnostics Menu presents the exciter fault and troubleshooting information. The menu is equipped with raise/lower power buttons, a 10 MHz reference status display, PA current and temperature display, a display containing all the system dc voltages, and a display providing troubleshooting information. A fault reset button allows a fault condition to be cleared.

AUDIO INPUT Menu. The Audio Input Menu contains several displays and allows audio inputs to be calibrated. A 30 segment color coded audio meter automatically switches to the active source (either AES/EBU, composite, or analog left/right) and presents the level. An active audio input display presents which audio input is being used by the exciter. An AES/EBU sample display presents the sampling rate at the AES/EBU receptacle. This can be from: 1) the studio for non-IBOC applications or 2) the IBOC circuit board if installed. If an IBOC circuit board is installed, the rate will be 44.1 kHz. A primary/backup button allows audio sources to be assigned as the primary and the backup. Several calibration buttons allow the input audio sources such as the AES/EBU source to be calibrated. An EXT SCA/RBDS setup button allows the external SCA to be enabled and programmed for the appropriate level.

LOG IN Menu. The FXi is equipped with a security system. The system is equipped several programmable parameters. The parameters are programmed using the Log In menu. The parameters include automatic/manual log out and enable/disable the security system.

3.4 MAIN MENU – DESCRIPTION.

Table 3-2 presents a description of the Main Menu displays. Refer to Figure 3-2 and Table 3-2 for information on the Main Menu.

3.5 INITIAL FXi PROGRAMMING.

3-13. The exciter requires the entry of data such as the frequency programming menu. The following text presents the procedures to program the FXi for the desired operation.

Table 3-2. MAIN MENU CONTROLS AND INDICATORS

NOMENCLATURE	DESCRIPTION
GENERAL FAULT	Illuminates to indicate a VSWR FAULT, TEMP FAULT, PWR SUPPLY FAULT, or FREQ UNLOCK fault condition. In addition, the indicator will illuminate to indicate any of the following fault conditions: 1) PA RF input high/low, 2) RF output low, 3) loss of AES/EBU, 4) loss of the 44.1 kHz clock, (IBOC circuit board only), 5) final 1, final 2, IPA, or driver current out-of-tolerance, 6) +16V, +12.5V, +5V, +3.3V, +1.8V, +1.5V, +7.5V out-of-tolerance, 7) DSP communication fault, 8) loss of composite, and 9) A/D and sample rate converter clock errors.
VSWR FAULT	Illuminates to indicate a PA VSWR foldback or shutdown condition. The foldback threshold is 1.5:1. The shutdown threshold is 2.0:1.

TEMP FAULT	Illuminates to indicate a PA heatsink temperature foldback or shutdown condition. The foldback threshold is 85°C for the FXi-60 and 105°C for the FXi-250. The shutdown threshold is 5°C above the foldback threshold.
PWR SUP FAULT	Illuminates to indicate one of the following conditions on the power supply circuit board: 1) +16V out-of-tolerance, 2) +7.5V out-of-tolerance, 3) +24V out-of-tolerance, 4) PAV (+48V) out-of-tolerance, 5) the heatsink temp is above the threshold, 6) the bulk supply is below 350 volts.
FREQ UNLOCK	Illuminates to indicate a VCO failure on the oscillator/filter circuit board or a 10 MHz reference fault.
MUTE	Displays a yellow square to indicate the exciter is muted from an external source such as the transmitter or the absence of a mute signal connected to J3-14. Displays a red octagon to indicate the exciter controller has muted the output due to one of the following fault conditions: 1) an automatic frequency control unlock, 2) general power supply fault, 3) VSWR shutdown, 4) temperature shutdown, or 5) RF drive low.
FWD PWR	Forward power display. Displays the exciter forward power output in watts.
RFL PWR	Reflected power display. Displays the exciter reflected power in watts.
FREQUENCY	Displays the exciter carrier frequency in MHz.
MODULATION METER	A 60 segment color coded bargraph display presenting exciter modulation. The range is from 0 to 150% in 2.5% increments. On levels below 10%, the meter will automatically switch to a 10% scale. The 10% scale is in 0.25% increments.
MENU BUTTONS	Used to access a specific menu.



3.6 LOG IN.

The FXi is equipped with a security system. This system prevents access to any screen other than the main menu. If you attempt to view other menus while a log in is required, a message, PLEASE LOG IN TO CONTINUE, appears. The password may be edited. Log in may also be enabled or disabled. Refer to Figure 3-38.

Initial programming consists of entering the default log in password to access to the programming menus. To log in, proceed as follows:

1. On the Main Menu, depress LOG IN. The Log In Menu will appear (refer to Figure 3-3).
2. Using the menu numeric keys, enter: 123456
3. Depress ENTER. The LOG IN button will change to LOG OUT on the Main Menu.

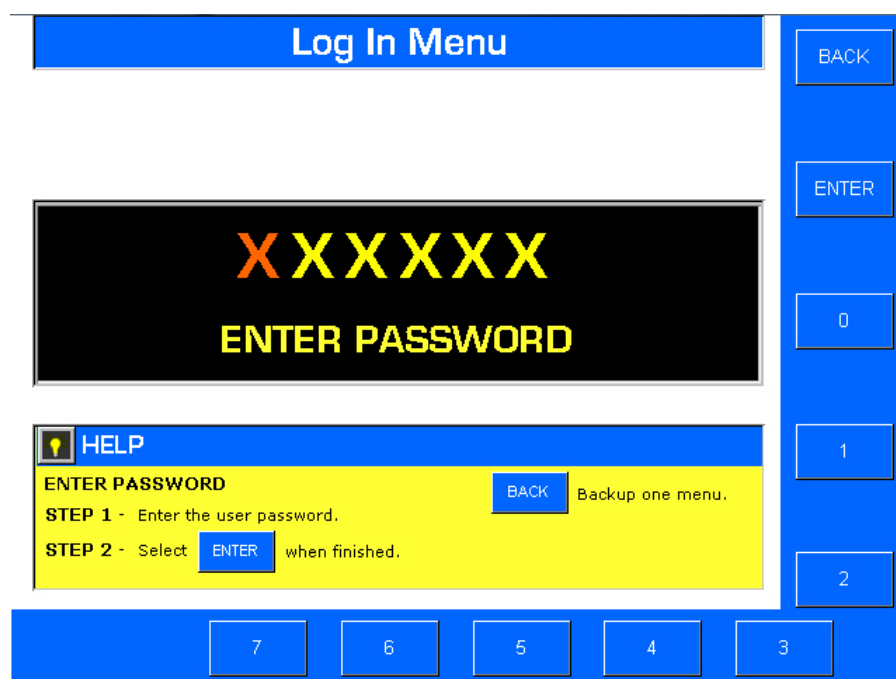


Figure 3-3. LOG IN MENU.

3.7 CARRIER FREQUENCY PROGRAMMING.

The FXi carrier frequency is programmed by the Freq menu (refer to Figure 3-4). The carrier frequency can be programmed in 10 kHz increments from 87.00 MHz to 108.99 MHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits are entered and the ENTER button is depressed. Enter the carrier frequency as follows.

Frequency Menu

CARRIER FREQUENCY 100.10 MHz

10 MHz REFERENCE (EXTERNAL OR INTERNAL) INTERNAL

N+1 CARRIER FREQUENCY

Frequency 1	100.10 MHz	Frequency 5	100.10 MHz
Frequency 2	100.10 MHz	Frequency 6	100.10 MHz
Frequency 3	100.10 MHz	Frequency 7	100.10 MHz
Frequency 4	100.10 MHz	Frequency 8	100.10 MHz

HELP

BACK Backup one menu.

PROG FREQ Programs the carrier frequency.

EXTERNAL REF **INTERNAL REF** Selects the use of an internal or external 10 MHz reference.

PROG N+1 FREQ Programs an N+1 carrier frequency.

N+1 FREQ SELECT Selects an N+1 carrier frequency to be active.

Buttons on the right: BACK, PROG FREQ, EXTERNAL REF, INTERNAL REF, PROG N+1 FREQ.

Button at bottom right: N+1 FREQ SELECT

Figure 3-4. FREQUENCY MENU

1. On the Main Menu, depress FREQ.
The Frequency Menu will appear (refer to Figure 3-4).
2. Depress PROG FREQ.
The Program Carrier Frequency Menu will appear (refer to Figure 3-5).

Program Carrier Frequency Menu

101.50 MHz

CARRIER FREQUENCY

HELP

STEP 1 - Enter the transmitter carrier frequency. The first digit must be a 1, 8, or 9.
Example - Enter 1011 for 101.1 MHz.
Example - Enter 10012 for 100.12
Example - Enter 8915 for 89.15 MHz.
Example - Enter 891 for 89.1 MHz.
Example - Enter 100 for 100.0 MHz.

STEP 2 - Depress **ENTER** when finished.

Buttons on the right: ENTER, 0, 1, 2, 3.

Buttons at the bottom: 9, 8, 7, 6, 5, 4.

Figure 3-5. PROGRAM CARRIER FREQUENCY MENU

3. For the first digit, enter a 1, 8, or 9.
The menu automatically adjusts the digits in response to the data entered.
4. Using the menu numeric keys, enter the remaining digits in the carrier frequency.
Note that the decimal point is automatically placed. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (4 for frequencies below 99.99 MHz and 5 for frequencies above 100 MHz) are entered and the ENTER button is depressed. If you do not press the final two digits after the decimal point, they will be entered as a zero.
5. When finished, depress ENTER.
The Carrier Frequency Confirmation Menu will appear (refer to Figure 3-6)
6. Depress CONFIRM to save the entered carrier frequency or CANCEL to delete the frequency.
The Frequency Menu will appear.

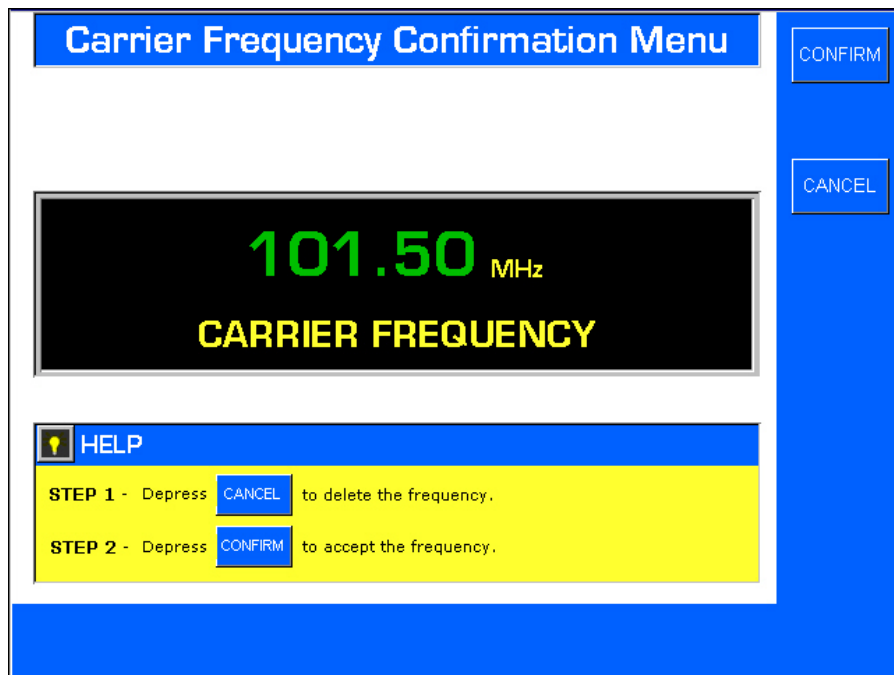


Figure 3-6. CARRIER FREQUENCY CONFIRMATION MENU

3.8 INTERNAL/EXTERNAL REFERENCE SELECT.

The FXi can be operated from the internal 10 MHz oscillator or from an external 10 MHz source such as from a GPS receiver. The exciter is equipped with two 10 MHz detector circuits to allow automatic switching between the internal and external references. For example, if an external 10 MHz source is connected to the unit, the exciter will: 1) automatically switch to the internal source if the external source fails or 2) switch to the external source if the internal source fails. If the selected source fails, the exciter will generate a fault condition.

The default source is internal. The reference source can be selected manually as follows:

1. On the Main Menu, depress **FREQ**.
The Frequency Menu will appear (refer to Figure 3-4. FREQUENCY MENU).
2. Depress **EXTERNAL REF** to select the external 10 MHz reference.
EXTERNAL will appear in the 10 MHz Reference display.
3. Depress **INTERNAL REF** to select the internal 10 MHz reference.
INTERNAL will appear in the 10 MHz Reference display.
4. When finished, depress **BACK**.

3.9 MODULATION PROGRAMMING.

The exciter modulation is programmed by the Modulation Menu (refer to Figure 3-7). The exciter modulation can be assigned a deviation from 50 kHz to 300 kHz. The default deviation is 75 kHz. Enter the modulation as follows:

Modulation Menu

BACK

100% MODULATION = 75 kHz

PREEMPHASIS 75 uS

HELP

MODULATION SETUP
STEP 1 - Select one of the following buttons to assign a deviation to equal 100 percent modulation.
 75 kHz DEV 100 kHz DEV 150 kHz DEV 200 kHz DEV 300 kHz DEV CUSTOM DEV

PREEMPHASIS SETUP
STEP 1 - Select one of the following buttons to assign preemphasis to the main channel.
 NO PREEMP 50 uS PREEMP 75 uS PREEMP

75 kHz DEV
 100 kHz DEV
 150 kHz DEV
 200 kHz DEV

75 uS PREEMP 50 uS PREEMP NO PREEMP CUSTOM DEV 300 kHz DEV

Figure 3-7. MODULATION MENU

1. On the Main Menu, depress MODULATION.
The Modulation Menu will appear.
2. Depress 75 kHz DEV, 100 kHz DEV, 150 kHz DEV, 200 kHz DEV, or 300 kHz DEV to select a deviation.
The selected deviation will appear in the modulation status display.
3. If a different deviation is desired, proceed as follows:
 1. Depress CUSTOM DEV. The Program Custom Modulation Menu will appear (refer to Figure 3-8)

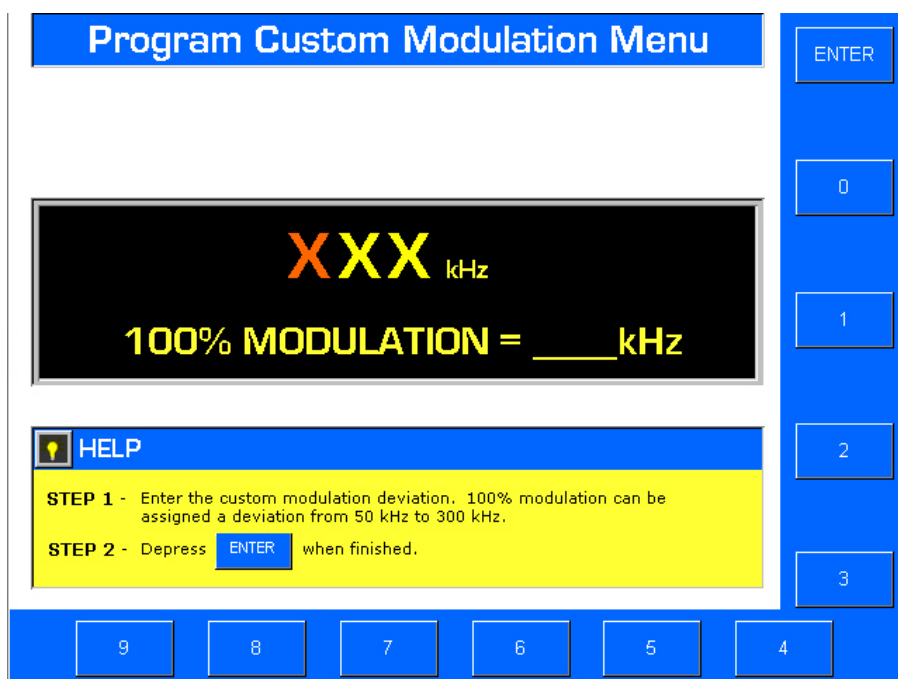


Figure 3-8. PROGRAM CUSTOM MODULATION MENU

2. Using the menu numeric keys, enter the desired deviation. The deviation can be from 50 kHz to 300 kHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for frequencies below 99 kHz and 3 for frequencies above 100 kHz) are entered and the ENTER button is depressed. Pressing ENTER after selecting an invalid value or pressing ENTER without entering any values, backs the user out of the menu without any changes being made. The menu automatically adjusts the digits in response to the data entered.
3. When finished, depress ENTER. The deviation will appear in the deviation display.
4. When finished, depress BACK.

3.10 PRE-EMPHASIS PROGRAMMING.

The Modulation Menu also contains the location for the assignment of pre-emphasis. The default is 75 μ S. To assign the main channel pre-emphasis, proceed as follows:

1. On the Main Menu, depress MODULATION. The Modulation Menu will appear (refer to Figure 3-7).
2. Depress 75 μ S PREEMP, 50 μ S PREEMP, or NO PREEMP to select the desired pre-emphasis. The selected pre-emphasis will appear in the Pre-emphasis status display.
3. When finished, depress BACK.

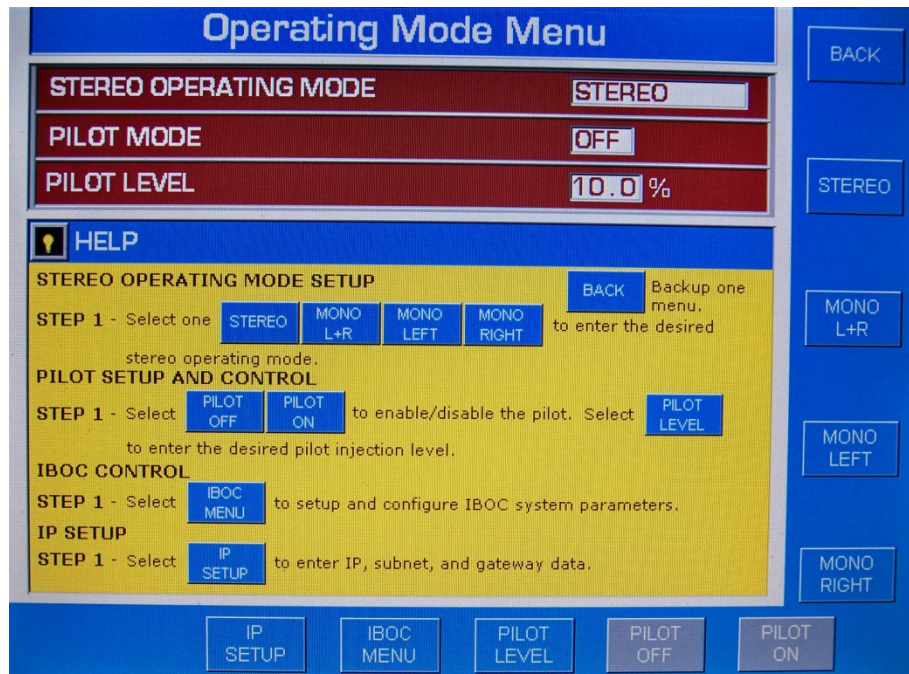


Figure 3-9. OPERATING MODE PROGRAMMING

3.11 OPERATING MODE PROGRAMMING.

The FXi is equipped with four stereo operating modes: 1) stereo, 2) mono left, 3) mono right, and 4) mono L+R. The default operating mode is stereo. To assign the stereo operating mode, proceed as follows:

1. On the Main Menu, depress OPER MODE. The Operating Mode Menu will appear (refer to Figure 3-9).
2. Depress: 1) STEREO for stereo operation, 2) MONO LEFT for mono left operation, 3) MONO RIGHT for mono right operation, or 4) MONO L+R for mono left + right operation. The selected STEREO OPERATING MODE will appear in the STEREO OPERATING MODE status display.
3. When finished, depress BACK.

3.12 PILOT PROGRAMMING.



NOTE IF COMPOSITE IS THE ACTIVE SOURCE, THE PILOT IS AUTOMATICALLY SET TO OFF.

NOTE

The pilot can be enabled/disabled and configured for the desired injection level using the Operating Mode Menu. The default pilot mode is ON. The default pilot level is 10.0%. If composite is the active source, the pilot is automatically set to off. To determine the audio input, from Main Menu, press AUDIO INPUT. The ACTIVE AUDIO INPUT status display shows the active input. To set up the pilot operating parameters, proceed as follows:

1. Refer to Figure 3-9. On the Main Menu, depress OPERating MODE. The Operating Mode Menu will appear.

2. Depress PILOT ON to enable the pilot or PILOT OFF to disable the pilot. Modulation is automatically adjusted to maintain the desired deviation when the pilot is operated to on or off. If PILOT ON or PILOT OFF are grayed out, the audio source is not compatible with an internally generated pilot tone.
3. To enter the desired pilot injection level, proceed as follows:
 - A. Depress PILOT LEVEL. The Pilot Level Menu will appear (refer to Figure 3-10).

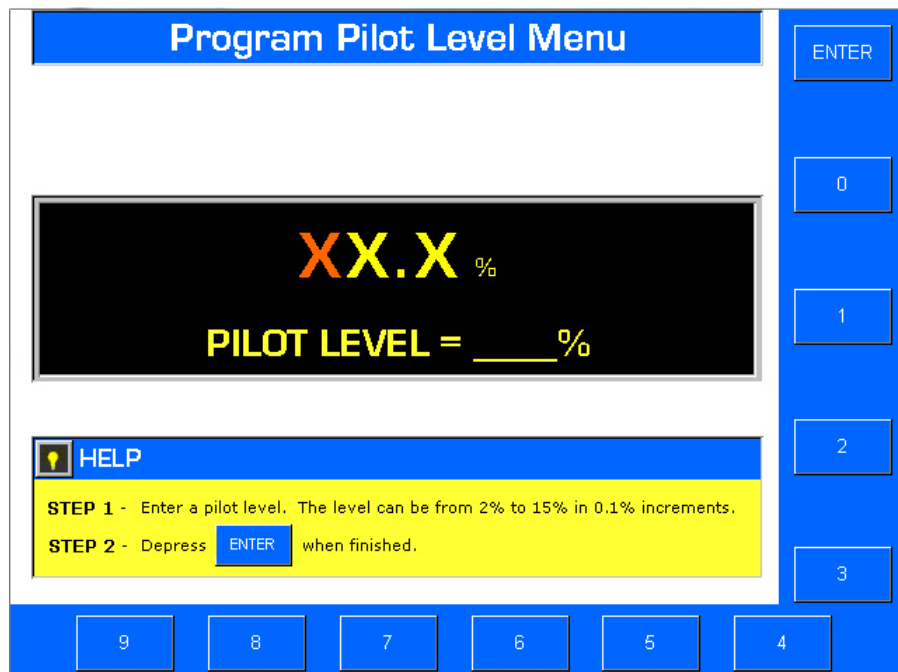


Figure 3-10. PROGRAM PILOT LEVEL MENU.

- B. Using the menu numeric keys, enter the desired pilot level. The level can be from 2% to 15% in 0.1% increments. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for levels below 9.9% and 3 for levels above 10%) are entered and the ENTER button is depressed. The menu automatically adjusts the digits in response to the data entered.
 - C. When finished, depress ENTER. The pilot level will appear in the PILOT LEVEL display.
4. When finished, depress BACK.

3.13 IBOC MODE PROGRAMMING.

IBOC mode operation is accessed through the Operating Mode (Oper) Menu (refer to Figure 3-11 Figure 3-9). For exciters without the optional IBOC circuit board, the IBOC operating mode will be disabled.

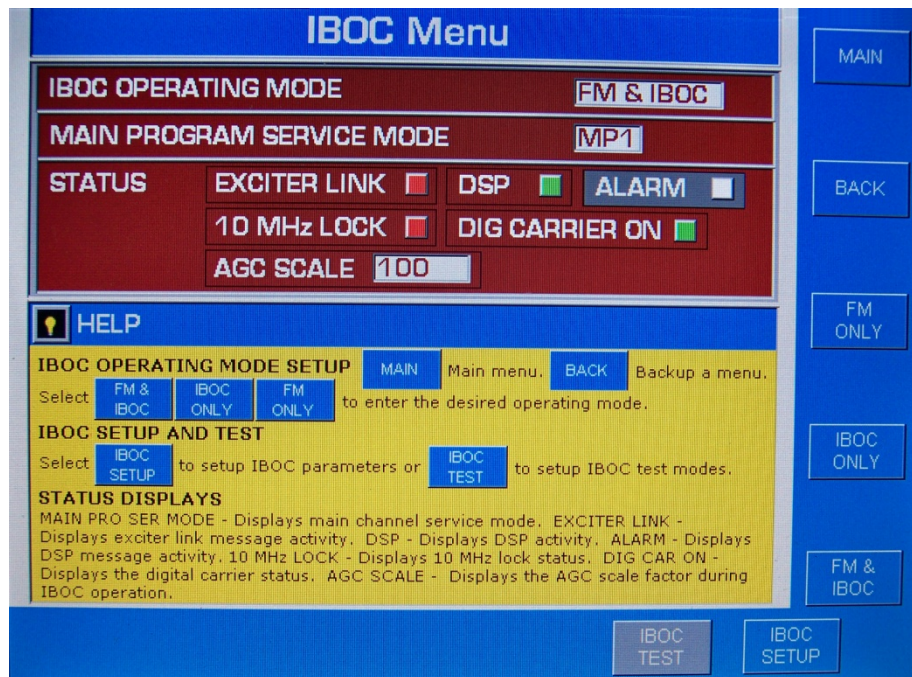


Figure 3-11. IBOC MENU

On this screen you will select IBOC operation; FM only, IBOC only or FM & IBOC operation and set the IBOC service mode.

3.14 COMPRESSOR/LIMITER PROGRAMMING.

Refer to Figure 3-12 Figure 3-12. The FXi compressor and limiter are programmed using the Compress/Limiter Menu. The compressor allows the user to reduce peak modulation using a programmable threshold, attack time, and release time. The limiter will provide a hard limit during high modulation conditions and is programmed by a threshold parameter. Both the compressor and limiter can be enabled or disabled. The compressor default parameters are: 1) compressor mode - off, 2) attack time - 1 millisecond, 3) release time - 100 milliseconds, and 4) threshold - 105%. The limiter default parameters are: 1) limiter mode - on, and 2) threshold - 110%. To setup the compressor/limiter operating parameters, proceed as follows:

Compressor/Limiter Menu

COMPRESSOR

MODE **OFF** ATTACK TIME **15** mSec

RELEASE TIME **500** mSec THRESHOLD **94** %

LIMITER MODE **ON** THRESHOLD **100** %

HELP

COMPRESSOR

STEP 1 - Select **COMP OFF** to disable or **COMP ON** to enable the compressor. **BACK**

STEP 2 - Select **COMP ATTACK** to enter the desired compressor attack time. Backup one menu.

STEP 3 - Select **COMP RELEASE** to enter the desired compressor release time.

STEP 4 - Select **COMP THRESHD** to enter the desired compressor threshold.

LIMITER

STEP 1 - Select **LIMITER OFF** to disable or **LIMITER ON** to enable the limiter.

STEP 2 - Select **LIMITER THRESHD** to enter the desired limiter threshold.

LIMITER THRESHD **LIMITER OFF** **LIMITER ON** **COMP THRESHD**

BACK **COMP ON** **COMP OFF** **COMP ATTACK** **COMP RELEASE**

Figure 3-12. COMPRESSOR/LIMITER MENU

1. On the Main Menu, depress COMPRESS/LIMITER. The Compressor/Limiter Menu will appear (refer to Figure 3-12).
2. To setup the compressor, proceed as follows:
 - A. Depress COMP ON to enable the compressor or COMP OFF to disable the compressor.
 - B. Enter the attack time by performing the following procedure. This determines how fast the compressor will react to compress modulation levels above the threshold.
 1. Depress COMP ATTACK. The Program Attack Time Menu will appear (refer to Figure 3-13).
 2. Using the menu numeric keys, enter the desired compressor attack time. The time can be from 1 to 100 milliseconds. If a data entry error occurs, depress ENTER at any time to back up to the previous menu.
 3. When finished, depress ENTER.

Program Attack Time Menu

ENTER

0

1

2

3

9 **8** **7** **6** **5** **4**

XXX mSEC

ATTACK TIME = ____ mSEC

HELP

STEP 1 - Enter the compressor attack time in milliseconds. The attack time is the speed at which the compressor will react to compress modulation over the threshold. The range is from 1 to 100 milliseconds.

STEP 2 - Depress **ENTER** when finished.

Figure 3-13. PROGRAM COMPRESSOR ATTACK TIME MENU

- C. Enter the release time by performing the following procedure. This determines how fast the compressor will react to release modulation once below the threshold level.
1. Depress COMP RELEASE. The Program Release Time Menu will appear (refer to Figure 3-14).
 2. Using the menu numeric keys, enter the desired compressor release time. The time can be from 10 to 5000 milliseconds (5 seconds). If a data entry error occurs, depress ENTER at any time to back up to the previous menu.
 3. When finished, depress ENTER.

Program Release Time Menu

XXXX mSEC

RELEASE TIME = ____ mSEC

HELP

STEP 1 - Enter the compressor release time in milliseconds. The release time is the speed at which the compressor will release modulation over the threshold. The range is from 10 to 5000 milliseconds (5 seconds).

STEP 2 - Depress **ENTER** when finished.

9 8 7 6 5 4

ENTER 0 1 2 3

Figure 3-14. PROGRAM COMPRESSOR RELEASE TIME MENU

D. Enter the threshold in modulation percentage by performing the following procedure. This programs the compressor to reduce the modulation level above this threshold.

1. Depress COMP THRESHD. The Program Threshold Menu will appear (refer to Figure 3-15).
2. Using the menu numeric keys, enter the desired compressor threshold. The threshold can be from 80% to 125%. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for thresholds below 99% and 3 for thresholds above 100%) are entered and the ENTER button is depressed.
3. When finished, depress ENTER.

The compressor operating modes will appear in the Compressor status display.

Program Threshold Menu

XXX%

THRESHOLD = ____%

HELP

STEP 1 - Enter the compressor threshold in modulation percentage. This programs the compressor to limit modulation in excess of this value. The modulation value range is from 80 to 125 percent.

STEP 2 - Depress **ENTER** when finished.

Buttons: ENTER, 0, 1, 2, 3, 9, 8, 7, 6, 5, 4

Figure 3-15. COMPRESSOR PROGRAM THRESHOLD MENU

1. To set up the limiter, proceed as follows:
 - A. Depress LIMITER ON to enable the limiter or LIMITER OFF to disable the limiter.
 - B. Determine the threshold in modulation percentage.
 - C. Enter the threshold in modulation percentage by performing the following procedure. This programs the limiter to hard limit the modulation level above this threshold.
 1. Depress LIMITER THRESHD. The Program Threshold Menu will appear (refer to Figure 3-16).
 2. Using the menu numeric keys, enter the desired compressor threshold. The threshold can be from 100% to 399%. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the three digits are entered and the ENTER button is depressed.
 3. When finished, depress ENTER. The selected limiter operating modes will appear in the Limiter status display.
2. When finished, depress BACK.

Program Threshold Menu

XXX %

THRESHOLD = ____ %

HELP

STEP 1 - Enter the limiter threshold in modulation percentage. This programs the limiter to clip modulation in excess of this value. The modulation value range is from 100 to 399 percent.

STEP 2 - Depress **ENTER** when finished.

Buttons: ENTER, 0, 1, 2, 3, 9, 8, 7, 6, 5, 4

Figure 3-16. LIMITER PROGRAM THRESHOLD MENU

3.15 INTERNAL SCA1 PROGRAMMING.

The FXi internal SCA1 operating parameters are programmed using the Internal SCA1 Menu (refer to Figure 3-17). Programmable SCA1 parameters include: 1) operating mode, 2) frequency, 3) deviation, 4) level, and 5) pre-emphasis. The default parameters are: 1) operating mode - off, 2) frequency - 67 kHz, 3) deviation - 5 kHz, 4) level - 10%, and 5) pre-emphasis - 150 μ S. To set up the SCA1 operating parameters, proceed as follows:

SCA1 Menu

SCA1 OPERATING MODE **OFF**

SCA1 FREQUENCY **67** kHz

SCA1 DEVIATION **0.0** kHz

SCA1 LEVEL **0.0** %

SCA1 PREEMPHASIS **75** uS

HELP

SETUP

STEP 1 - Select **SCA1 OFF** to disable SCA1 or **SCA1 ON** to enable SCA1.

STEP 2 - Select **SCA1 FREQ** to enter the desired SCA1 frequency. Ex - 67 kHz.

STEP 3 - Select **SCA1 DEV** to enter the desired SCA1 deviation. Ex - 5 kHz.

BACK **STEP 4** - Select **SCA1 LEVEL** to enter the desired SCA1 injection level.

STEP 5 - Select **NO PREEMP** **50 uS PREEMP** **75 uS PREEMP** **150 uS PREEMP** to assign the SCA1 preemphasis.

Backup one menu.

BACK

150 uS PREEMP **75 uS PREEMP** **50 uS PREEMP** **NO PREEMP** **SCA1 LEVEL**

BACK **SCA1 ON** **SCA1 OFF** **SCA1 FREQ** **SCA1 DEV**

Figure 3-17. INTERNAL PROGRAM SCA1 MENU

1. On the Main Menu, depress INTERNAL SCA1. The Internal SCA1 Menu will appear (refer to Figure 3-17).
2. To enable SCA1, depress SCA1 ON. To disable SCA1, depress SCA1 OFF. The SCA1 operating mode will appear in the SCA1 Operating Mode status display.
3. To program the SCA1 frequency, proceed as follows:
 - A. Depress SCA1 FREQ. The Internal SCA1 Frequency Menu will appear (refer to Figure 3-18).
 - B. Select 67 kHz FREQ for 67 kHz operation or 92 kHz FREQ for 92 kHz operation. The selected SCA1 frequency will appear in the SCA1 Frequency status display.
 - C. If a custom frequency is desired, proceed as follows:
 1. Select CUSTOM FREQ. The Internal SCA1 Custom Frequency Menu will appear (refer to Figure 3-19).
 2. Using the menu numeric keys, enter the desired frequency. The frequency can be from 20 kHz to 99 kHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until 2 digits are entered and the ENTER button is depressed.
 3. When finished, depress ENTER. Press BACK or MAIN for more menus.

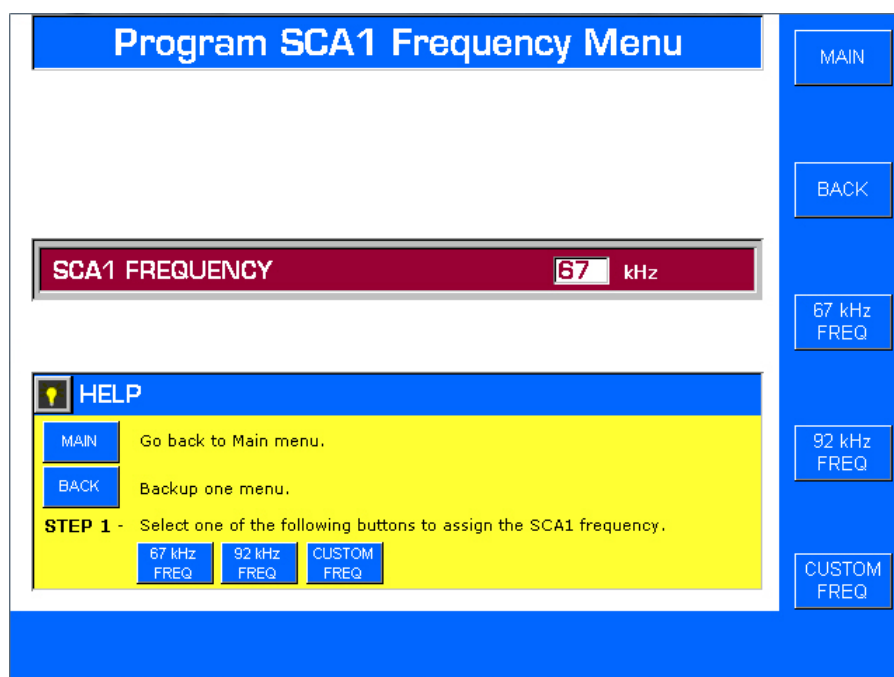


Figure 3-18. INTERNAL PROGRAM SCA1 FREQUENCY MENU

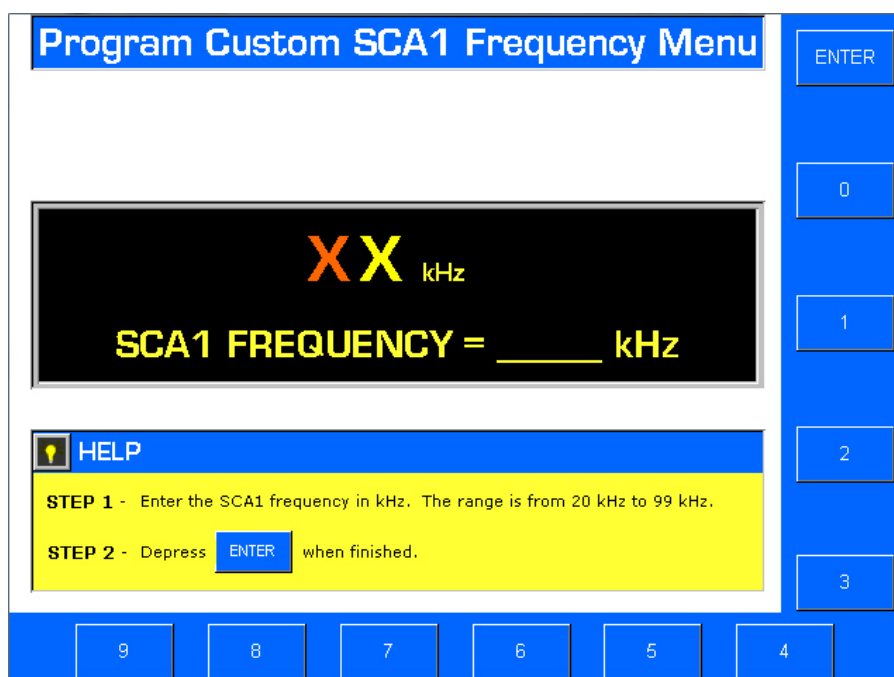


Figure 3-19. INTERNAL Custom SCA1 FREQUENCY MENU

4. To program the SCA1 deviation, proceed as follows:
 - A. From SCA1 menu depress SCA1 DEV. The Internal Program SCA1 Deviation Menu will appear (refer to Figure 3-20).
 - B. Select 5 kHz FREQ for 5 kHz operation or 7.5 kHz FREQ for 7.5 kHz operation. The selected SCA1 deviation will appear in the SCA1 Deviation status display.

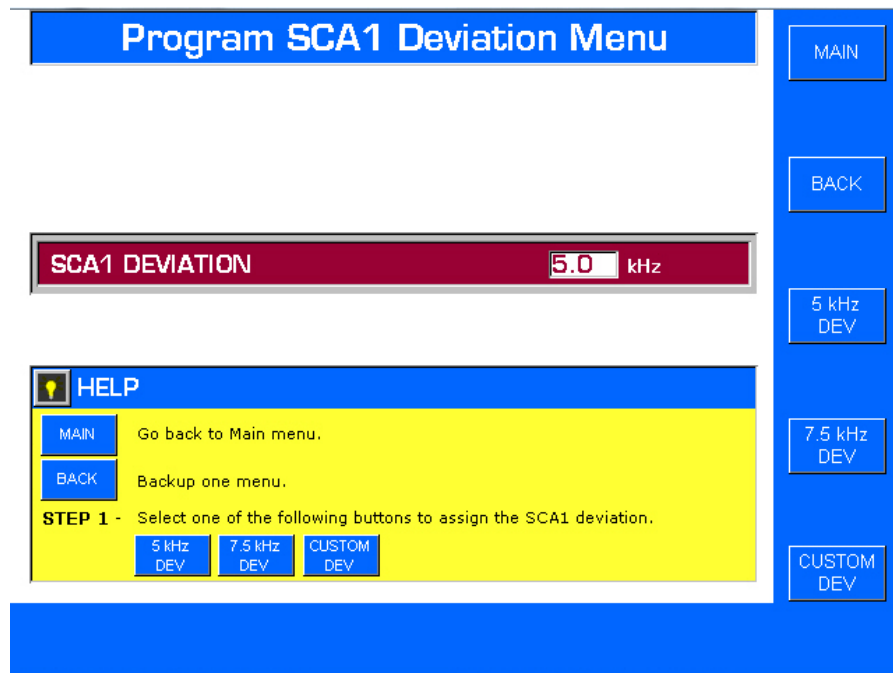


Figure 3-20. INTERNAL PROGRAM SCA1 DEVIATION MENU

- C. If a custom deviation is desired, proceed as follows:
 1. From SCA1 Deviation menu select CUSTOM DEV. The Internal Program SCA1 Deviation Menu will appear (refer to Figure 3-21).
 2. Using the menu numeric keys, enter the desired deviation. The deviation can be from 2.5 kHz to 10 kHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for deviations below 9.9 kHz and 3 for 10.0 kHz) are entered and the ENTER button is depressed.
 3. When finished, depress ENTER.
5. To program the SCA1 level, proceed as follows:
 - A. A. Depress SCA1 LEVEL. The Internal SCA1 Level Menu will appear (refer to Figure 3-22).
 - B. B. Using the menu numeric keys, enter the desired level. The level can be from 2% to 15% in 0.1% increments. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for levels below 9.9% and 3 levels above 10%) are entered and the ENTER button is depressed. The new SCA1 level appears in the SCA1 LEVEL status display.
 - C. C. When finished, depress ENTER.
6. To program the SCA1 pre-emphasis, select 50 μ S PREEMP for 50 μ S operation, 75 μ S PREEMP for 75 μ S operation, or 150 μ S PREEMP for 150 μ S operation. The selected SCA1 pre-emphasis will appear in the SCA1 Pre-emphasis status display.
7. When finished, depress BACK.

Program Custom SCA1 Deviation Menu

ENTER

0

1

2

3

9

8

7

6

5

4

XX.X kHz

SCA1 DEVIATION = ____ kHz

HELP

STEP 1 - Enter the SCA1 deviation in kHz. The range is from 2.5 to 10 kHz.

STEP 2 - Depress ENTER when finished.

Figure 3-21. INTERNAL CUSTOM SCA1 DEVIATION MENU

Program SCA1 Level Menu

ENTER

0

1

2

3

9

8

7

6

5

4

XX.X %

SCA1 LEVEL = ____ %

HELP

STEP 1 - Enter the SCA1 level. The level can be from 2% to 15% in 0.1% increments. Normal is 10%.

STEP 2 - Depress ENTER when finished.

Figure 3-22. INTERNAL SCA1 LEVEL MENU

3.16 INTERNAL SCA2 PROGRAMMING.

The FXi internal SCA2 operating parameters are programmed using the Internal SCA2 Menu (refer to Figure 3-23). Programmable SCA2 parameters include: 1) operating mode, 2) frequency, 3) deviation, 4) level, and 5) pre-emphasis. The default parameters are:

1) operating mode - off, 2) frequency - 92 kHz, 3) deviation - 5 kHz, 4) level - 10%, and 5) pre-emphasis - 150 μ S. To set up the SCA2 operating parameters, proceed as follows:

The SCA2 Menu interface is displayed on a screen. At the top, a blue header bar contains the text "SCA2 Menu". Below this, five red rectangular buttons are arranged vertically, each with white text: "SCA2 OPERATING MODE OFF", "SCA2 FREQUENCY 92 kHz", "SCA2 DEVIATION 5.0 kHz", "SCA2 LEVEL 10.0 %", and "SCA2 PREEMPHASIS 150 μ S". To the right of these buttons is a vertical column of five blue buttons: "BACK", "SCA2 ON", "SCA2 OFF", "SCA2 FREQ", and "SCA2 DEV". Below the red buttons is a yellow rectangular area containing a "HELP" section. The "HELP" section is titled "SETUP" and lists five steps: STEP 1 - Select SCA2 OFF to disable SCA2 or SCA2 ON to enable SCA2; STEP 2 - Select SCA2 FREQ to enter the desired SCA2 frequency; STEP 3 - Select SCA2 DEV to enter the desired SCA2 deviation; STEP 4 - Select SCA2 LEVEL to enter the desired SCA2 injection level; and STEP 5 - Select NO PREEMP, 50 μ S PREEMP, 75 μ S PREEMP, or 150 μ S PREEMP to assign the SCA2 preemphasis. Below the "HELP" section is a row of five blue buttons: "150 μ S PREEMP", "75 μ S PREEMP", "50 μ S PREEMP", "NO PREEMP", and "SCA2 LEVEL".

Figure 3-23. INTERNAL SCA2 MENU

1. On the Main Menu, depress INTERNAL SCA2. The Internal SCA2 Menu will appear (refer to Figure 3-23).
2. To enable SCA2, depress SCA2 ON. To disable SCA2, depress SCA2 OFF. The selected SCA2 operating mode will appear in the SCA2 Operating Mode status display.
3. To program the SCA2 frequency, proceed as follows:
 - A. Depress SCA2 FREQ. The Internal Program SCA2 Frequency Menu will appear (refer to Figure 3-24).
 - B. Select 67 kHz FREQ for 67 kHz operation or 92 kHz FREQ or 92 kHz operation. The selected SCA2 frequency will appear in the SCA2 Frequency status display.
 - C. If a custom frequency is desired, proceed as follows:
 1. Select CUSTOM FREQ. The Internal SCA2 Custom Frequency Menu will appear (refer to Figure 3-25).
 2. Using the menu numeric keys, enter the desired frequency. The frequency can be from 20 kHz to 99 kHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until 2 digits are entered and the ENTER button is depressed.
 3. When finished, depress ENTER. Press BACK or MAIN for more menus. The selected SCA2 frequency will appear in the SCA2 Frequency status display.

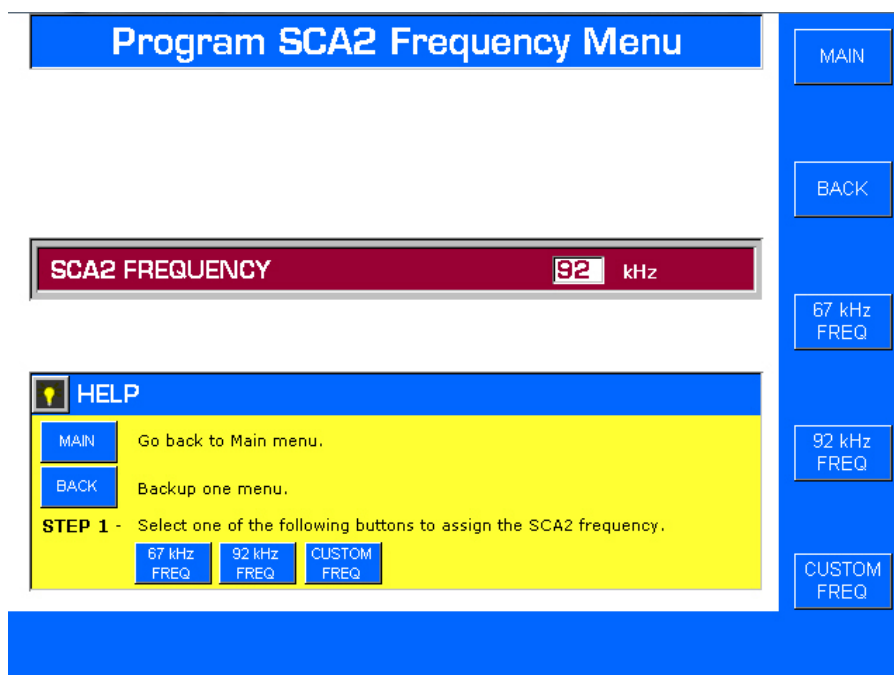


Figure 3-24. INTERNAL PROGRAM SCA2 FREQUENCY MENU

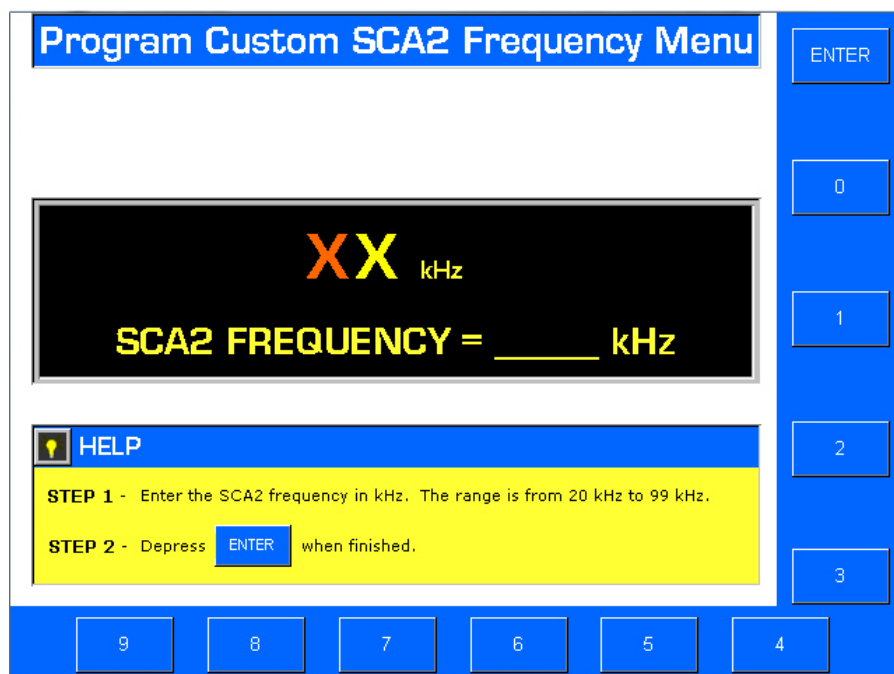


Figure 3-25. INTERNAL PROGRAM CUSTOM SCA2 FREQUENCY MENU

4. To program the SCA2 deviation, proceed as follows:
 - A. From SCA2 menu depress SCA2 DEV. The Internal Program SCA2 Deviation Menu will appear (refer to Figure 3-26).

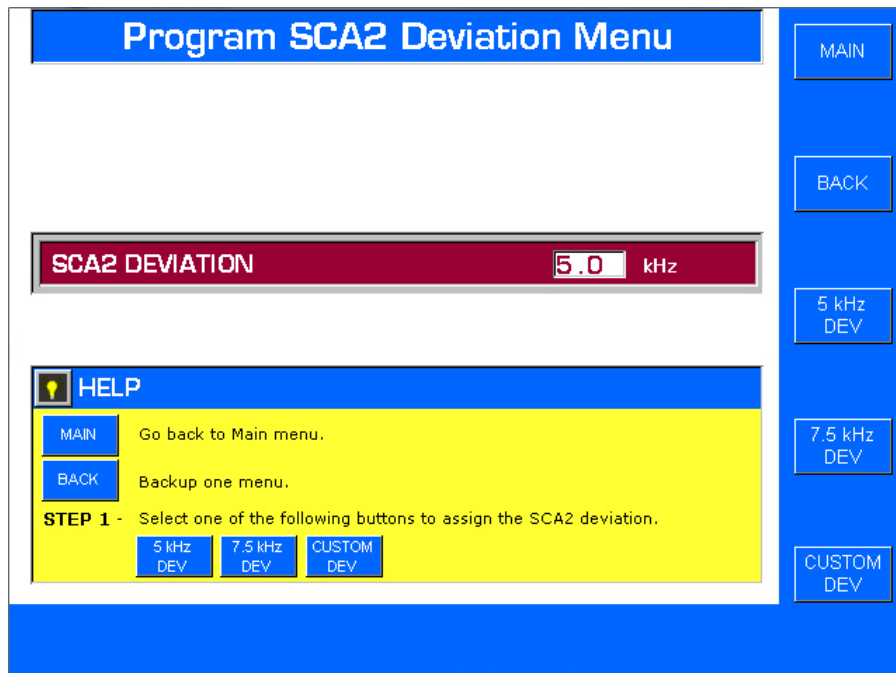


Figure 3-26. INTERNAL PROGRAM SCA2 DEVIATION MENU

- B. Select 5 kHz FREQ for 5 kHz operation or 7.5 kHz FREQ for 7.5 kHz operation. The selected SCA2 deviation will appear in the SCA2 deviation status display.
- C. If a custom deviation is desired, proceed as follows:
 1. Select CUSTOM DEV. The Internal Program SCA2 Custom Deviation Menu will appear (refer to Figure 3-27).

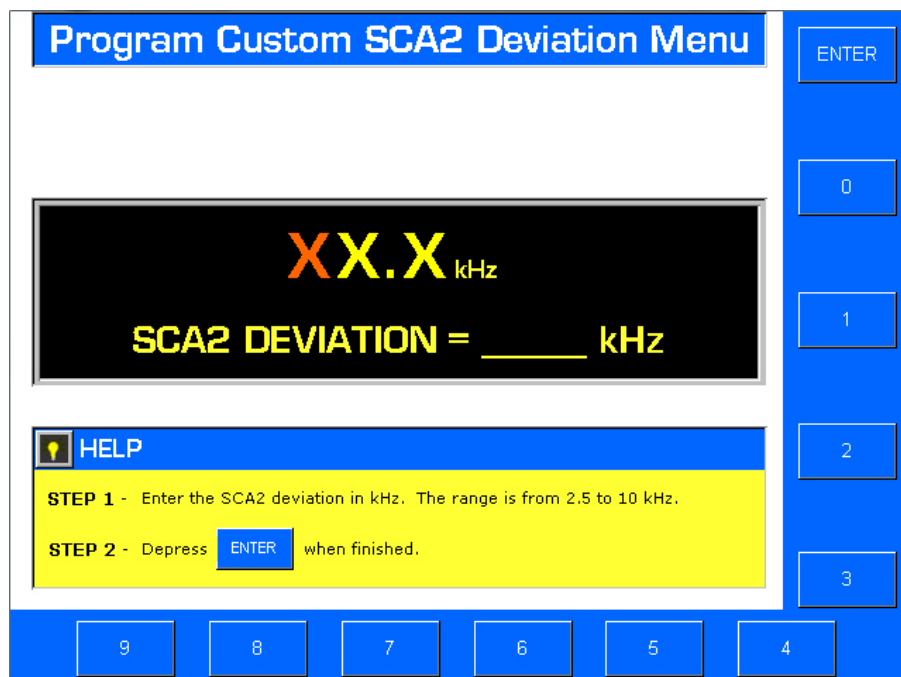


Figure 3-27. INTERNAL CUSTOM SCA2 DEVIATION MENU

2. Using the menu numeric keys, enter the desired deviation. The deviation can be from 2.5 kHz to 10 kHz. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for deviations below 9.9 kHz and 3 for 10.0 kHz) are entered and the ENTER button is depressed. The selected SCA2 deviation will appear in the SCA2 deviation status display.
3. When finished, depress ENTER. Depress MAIN or BACK for more menus.
5. To program the SCA2 level, proceed as follows:
 - A. From SCA2 menu depress SCA2 LEVEL. The Internal Program SCA2 Level Menu will appear (refer to Figure 3-28).
 - B. Using the menu numeric keys, enter the desired level. The level can be from 2% to 15% in 0.1% increments. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for levels below 9.9% and 3 for levels above 10%) are entered and the ENTER button is depressed.
 - C. When finished, depress ENTER. The selected SCA2 level appears in the SCA2 LEVEL status display.
6. To program the SCA2 pre-emphasis, select 50 μ S PREEMP for 50 μ S operation, 75 μ S PREEMP for 75 μ S operation, or 150 μ S PREEMP for 150 μ S operation. The selected SCA2 pre-emphasis will appear in the SCA2 Pre-emphasis status display.
7. When finished, depress BACK.

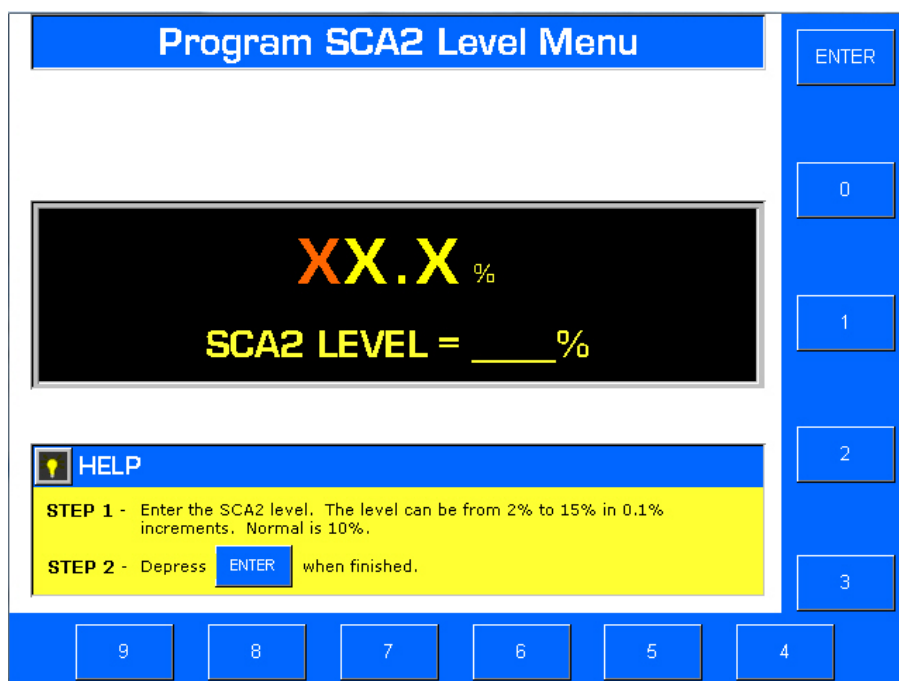


Figure 3-28. INTERNAL PROGRAM SCA2 LEVEL MENU

3.17 INTERNAL RBDS/RDS PROGRAMMING.

The FXi internal RBDS/RDS operating parameters are programmed using the Internal RBDS Menu (refer to Figure 3-29). Programmable RBDS parameters include: 1) operating mode and 2) level. The default parameters are: 1) operating mode - off and 2) level - 10%. To set up the RBDS operating parameters, proceed as follows:

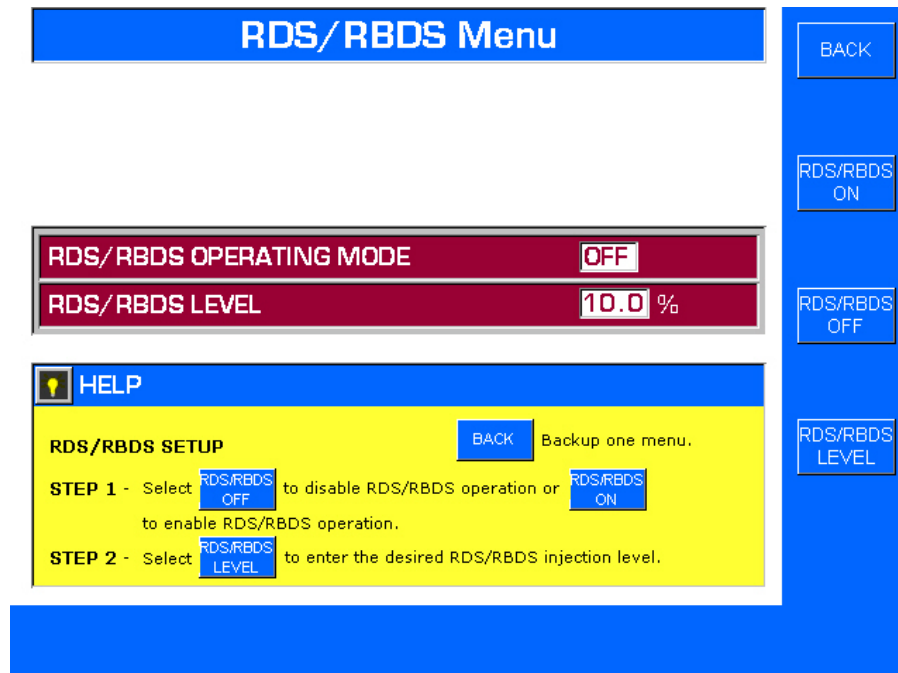


Figure 3-29. INTERNAL RBDS MENU

1. On the Main Menu, depress INTERNAL RBDS. The Internal RBDS/RDS Menu will appear (refer to Figure 3-29).
2. To enable RBDS operation, depress RDS/RBDS ON. To disable RBDS operation, depress RDS/RBDS OFF. The selected RDS/RBDS operating mode will appear in the RDS/RBDS Operating Mode status display.
3. To program the RBDS level, proceed as follows:
 - A. Depress RDS/RBDS LEVEL. The Internal Program RDS/RBDS Level Menu will appear (refer to Figure 3-30).
 - B. Using the menu numeric keys, enter the desired level. The level can be from 2% to 15% in 0.1% increments. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for levels below 9.9% and 3 for levels above 10%) are entered and the ENTER button is depressed.
 - C. When finished, depress ENTER. The selected level appears in the RDS/RBDS LEVEL status display.
4. When finished, depress BACK.
5. For details on entering RBDS/RDS data refer to paragraph RBDS/RDS DATA ENTRY.

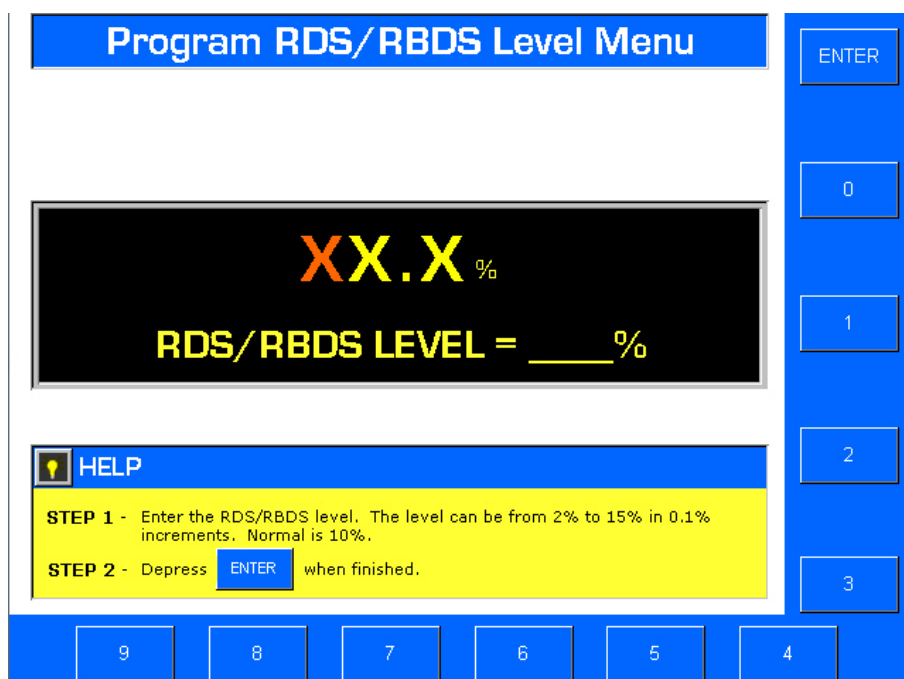


Figure 3-30. PROGRAM RDS/RBDS LEVEL MENU

3.18 AUDIO INPUT – SETUP/SELECTION/CALIBRATION.

The calibration process allows the FXi to accommodate various input levels to provide 100% modulation. The FXi audio sources are set up, calibrated, and selected using the Audio Input Menu (refer to Figure 3-31 and Table 3-3). FXi audio inputs sources include: 1) AES/EBU, 2) analog LEFT/RIGHT, and 3) COMPOSITE. AES/EBU, COMPOSITE, and analog LEFT/RIGHT can be configured as a primary audio source. AES/EBU, COMPOSITE, analog LEFT/RIGHT, and NONE can be assigned as the backup audio source.

In the event a fault in the AES/EBU or composite primary source, the FXi will automatically switch to the backup source if selected. If analog LEFT/RIGHT is selected as the primary source, no backup source is allowed (a fault cannot be detected in the LEFT/RIGHT source). When a primary source is selected, the source is automatically switched and becomes the active input source. The default parameters are: 1) primary audio source - AES/ EBU and 2) backup audio source - COMPOSITE. The active source is displayed in the ACTIVE AUDIO INPUT display. The source level is displayed on the input meter which appears just below the Audio Input Menu title bar.

Optional IBOC Audio Switching buttons (not shown) are Internal FSi Bypass Enable and Disable. The FSi has a signal output into the FXi Exciter in a fault condition. The fault condition coming from the FSi triggers an Audio bypass switch to activate which bypasses any delay to the FM AES signal. The enable/dis-able selection option changes the Exciter activation. If dis-able is selected, the Exciter will ignore the fault condition coming from the FSi. If enabled, the Exciter will report the fault condition coming from the FSi and auto switch "bypass", bypassing the selected audio; this bypasses any function of the exciter.

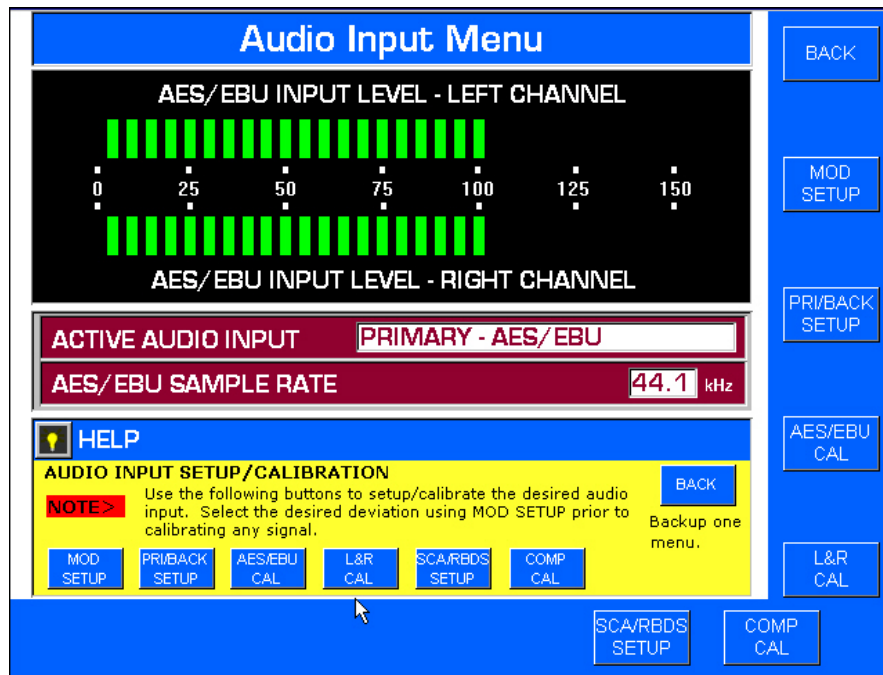


Figure 3-31. AUDIO INPUT MENU

Table 3-3. AUDIO INPUT MENU CONTROLS AND INDICATORS

NOMENCLATURE	DESCRIPTION
AUDIO INPUT METER	A 30 segment color coded bargraph display presenting the audio source input level. The range is from 0 to 150% in 5% increments.
ACTIVE AUDIO INPUT	Displays the active audio source.
AES/EBU SAMPLE	The AES/EBU sample display is a status display presenting two parameters. The FM display presents the sampling rate from the studio in non-IBOC installations or the sampling rate from the IBOC interface circuit board. With the IBOC interface circuit board installed, the rate will be 44.4 kHz.
MOD SETUP	Accesses the modulation menu to set up the deviation.
PRI/BACK SETUP	Used to assign the primary and backup audio sources.
AES/EBU CAL	Selects a menu used to select the AES/EBU source (either wire or optical) and calibrates the AES/EBU audio input level.
L&R CAL	Selects a menu used to calibrate the analog left/right audio input level.
SCA/RBDS SETUP	This button accesses the internal SCA menu and internal RBDS menu. In-addition, the button accesses an external SCA/RBDS setup menu and an external SCA/RBDS calibration menu.
COMP CAL	Selects a menu used to calibrate the composite input level.

3.18.1 AUDIO INPUT – SETUP.

The audio input must be calibrated. To set up the audio input operating parameters, perform the following procedures. The FXi audio input setup consists of selecting the primary and backup audio sources. Primary audio sources include: 1) AES/EBU, 2) analog LEFT/RIGHT, and 3) COMPOSITE. Backup audio sources include: 1) AES/EBU, 2) analog LEFT/RIGHT, 3) COMPOSITE, and 4) NONE. An audio input source cannot be assigned as the primary and the backup. If analog LEFT/RIGHT is selected as the primary source, NONE is automatically selected as the backup. This is due to the lack of a signal to determine when the left/right input is missing. The default primary audio source is COMPOSITE. The default backup audio source is NONE. Menu buttons will grey out to prevent the mis-assignment of the input sources. To assign the primary and backup audio sources, proceed as follows:

1. From the Audio Input Menu Depress PRI/BACK SETUP. The Audio Input Setup Menu will appear (refer to Figure 3-32).



NOTE IF COMPOSITE IS SELECTED AS THE PRIMARY OR BACKUP SOURCE AND COMPOSITE IS ACTIVE, THE PILOT IS
NOTE AUTOMATICALLY SET TO OFF.

2. To assign the primary audio source, depress: 1) PRIMARY AES/EBU to assign AES/EBU as the primary source, 2) PRIMARY COMP to assign composite as the primary source, or 3) PRIMARY LEFT/RGT to assign analog left/right as the primary source. A source cannot be assigned as both the primary and backup. If analog LEFT/RIGHT is selected, the backup will automatically be configured to NONE. If COMPOSITE is selected as the primary or backup source and COMPOSITE is active, the pilot is automatically set to off. No pilot will appear on the modulation meter. The selected source will appear in the PRIMARY AUDIO INPUT status display.

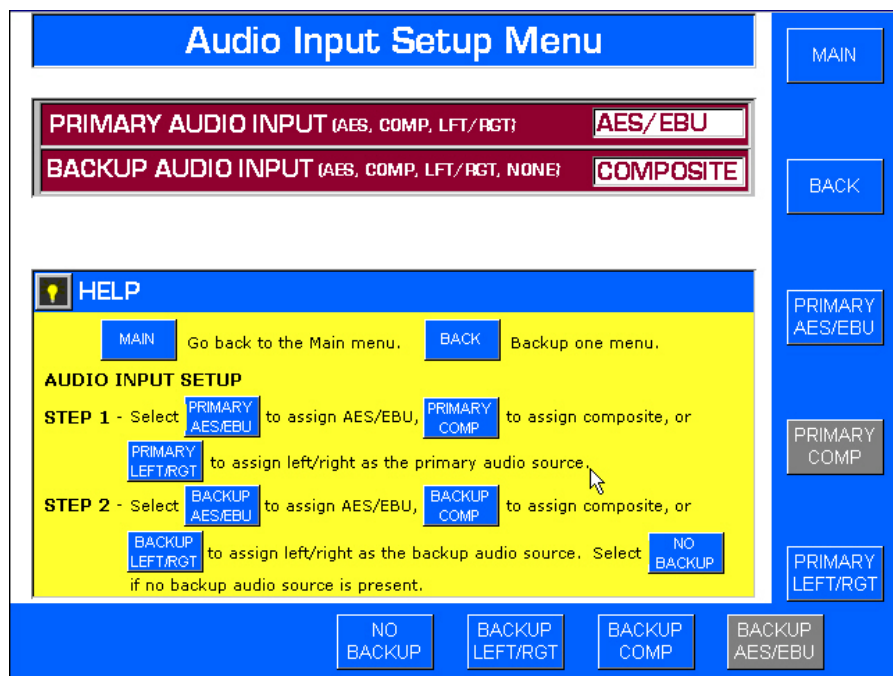


Figure 3-32. AUDIO INPUT SETUP MENU

3. To assign the backup audio source, depress: 1) BACKUP AES/EBU to assign AES/EBU as the backup source, 2) BACKUP COMP to assign composite as the backup source, 3) BACKUP LEFT/RGT to assign analog left/right as the backup source, or 4) NO BACKUP for systems with no backup audio source. A source cannot be assigned as both the primary and backup. The selected source will appear in the BACKUP AUDIO INPUT status display.
4. When finished, depress BACK.

(Optional) Setting Return-to-Primary Time

If AES is the primary input the FXi will automatically switch from the secondary source back to primary if it returns. The amount of time after the primary has returned before the FXi will actually switch back to the primary source is programmable from 0 seconds to 120 seconds. The default is 0 seconds. Setting the time requires establishing communication with rear-mounted SERIAL PORT J10. Refer to the section "RBDS/RDS DATA ENTRY" for details on setting up HyperTerminal communication. Once communication is established, an FXi-generated message appears on the terminal screen. Refer to Figure 3-45.

Press d to enter the restore-delay time. The following command-line message appears on the terminal:

```
d
Enter the delay desired for waiting (in seconds) to automatically return to the primary
audio input after a fault has caused an automatic switch to the backup input. Maximum
entry is 120 seconds Old value is: 22
```

Enter the return-to primary delay time. The new time is effective immediately. Remove the serial connection from the rear of the FXi when done

3.18.2 ADJUSTMENTS – CALIBRATION.

The FXi audio inputs may require calibration. Table 3-4 presents the required levels for the input sources. The calibration process allows the FXi to accommodate various input levels to provide 100% modulation. If the nominal levels are used, the sources are calibrated at the factory and no calibration is required. Calibrate the audio signals in the following order: 1) AES/EBU, 2) analog left/right, 3) external SCA/RBDS, and 4) composite. If a signal is not used, do not perform the calibration procedure.

Table 3-4. AUDIO INPUT LEVELS

AUDIO INPUT	FIGURE	LEVEL
AES/EBU	Figure 2-2	Nominal – -2 dBfs Range – 0 to -10 dBfs
Analog Left/Right	Figure 2-3	Nominal – +10 dBm Range – 0 dBm to +11 dBm
Composite	Figure 2-4	Nominal – 3.5 volts peak-to-peak Range – 1.0 to 4.0 volts peak-to-peak
External SCA/RBDS	Figure 2-6	Nominal – 3.5 volts peak-to-peak Range – 1.0 to 4 volts peak-to-peak
Audio Level For Internal SCA (No calibration required)	Figure 2-5	Nominal – +10 dBm Range – 0 dBm to +11 dBm





NOTE PRIOR TO CALIBRATING ANY AUDIO SIGNAL,
ENSURE THE MODULATION DEVIATION IS
NOTE ASSIGNED.



NOTE IF NOMINAL INPUT LEVELS ARE USED, THE LEVELS
ARE CALIBRATED AT THE FACTORY. THEREFORE,
NO CALIBRATION PROCEDURES WILL BE
NOTE REQUIRED.

3.18.3 PRE-CALIBRATION.

Prior to calibrating any audio input signal, the modulation deviation must be assigned. Ensure the modulation is assigned before proceeding by performing the MODULATION PROGRAMMING in the preceding text.

3.18.4 AES/EBU CALIBRATION.

If an AES/EBU audio source is to be used with the FXi, the source must be calibrated (refer to Figure 3-33). This calibration procedure compensates for level variations in the audio source. To calibrate the AES/EBU source, proceed as follows:



NOTE ENSURE THE MODULATION DEVIATION IS
SELECTED AND ALL INTERNAL/EXTERNAL SCA/
NOTE RBDS SIGNALS ARE DISABLED BEFORE
PROCEEDING



CAUTION *CALIBRATION SHOULD NOT BE PERFORMED DURING
ON-AIR OPERATION. THE AUDIO SOURCE TO BE
CAUTION CALIBRATED WILL TEMPORARILY BE THE ACTIVE
PRIMARY SOURCE DURING THE PROCESS.*

Prior to calibrating the AES/EBU signal, the desired modulation deviation must be assigned. If the modulation deviation has not been assigned, access the menu by using the MOD SETUP button on the Audio Input Menu and assign the desired modulation deviation.

1. The AES/EBU source can be calibrated using two methods. One method is to select AES/EBU as the primary source. This allows the level to be viewed and remain on the meter during the entire calibration process. The second method is to not select the AES/EBU source as the primary. In this case, the unit will automatically switch and select the AES/EBU source as the primary. The levels will appear on the meter only during the actual calibration process. When the calibration process is finished, the unit will automatically return to the selected primary source.
2. Ensure the exciter is off-the-air and depress AES/EBU CAL. The AES/EBU Setup/Cal Menu will appear.
3. Depress AES/EBU WIRE to select the XLR wire input or AES/EBU OPTICAL to select the TOSLINK optical input.

The selected AES/EBU source will appear in the status display.

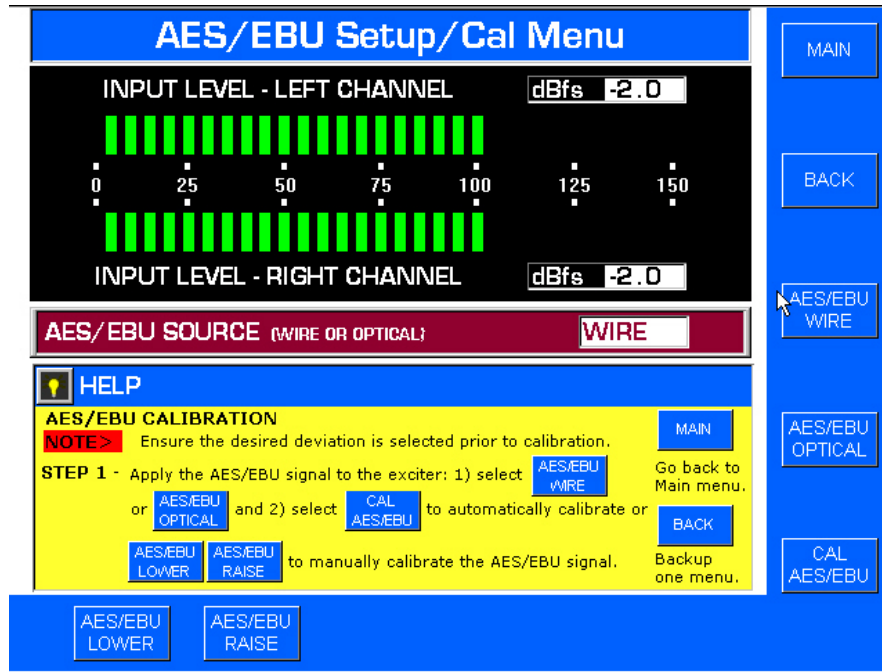


Figure 3-33. AES/EBU SETUP MENU

4. Ensure all internal and external SCA/RBDS signals are disabled.
5. Refer to Figure 2-2. Apply the external AES/EBU audio source to the FXi at a nominal level of -2 dBfs. The input level range is from 0 to -10 dBfs.
6. Depress CAL AES/EBU.
A CALIBRATING NOW message will appear during the calibration process. The level will appear on the meter.
7. If desired, the level can be adjusted manually by pressing the AES/EBU LOWER and AES/EBU RAISE so that the indicated level is 100. If an exact meter indication is not obtained, adjust the input level of the external source slightly to achieve the desired meter indication.
8. When finished, depress BACK.

3.18.5 ANALOG LEFT/RIGHT CALIBRATION.

If an analog left/right audio source is to be used with the FXi, the source must be calibrated (refer to Figure 3-34). This calibration procedure compensates for level variations in the left and right channels. To calibrate the analog left/right source, proceed as follows:



NOTE

NOTE

ENSURE THE MODULATION DEVIATION IS SELECTED AND ALL INTERNAL/EXTERNAL SCA/RBDS SIGNALS ARE DISABLED BEFORE PROCEEDING

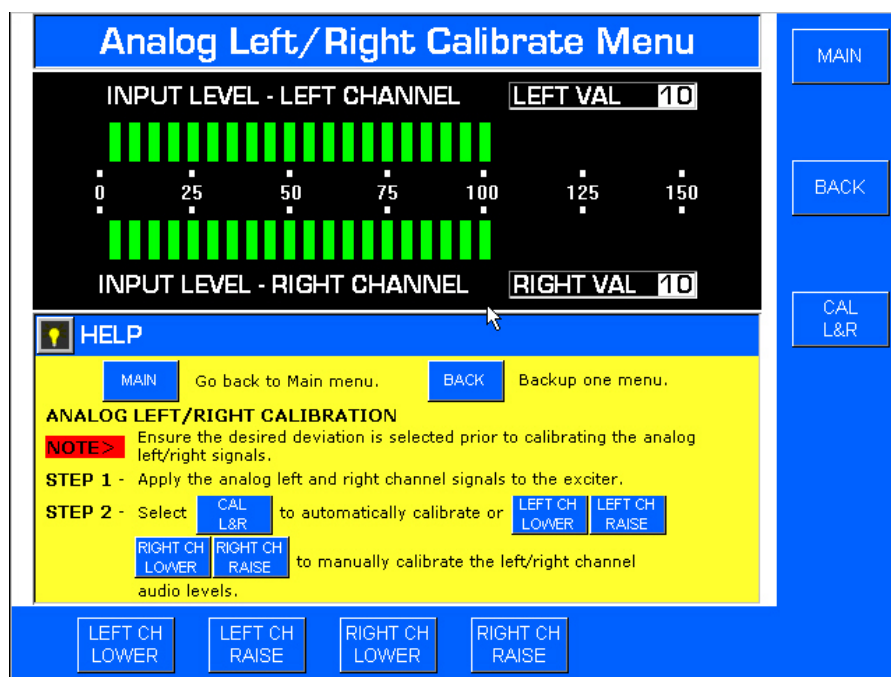


Figure 3-34. ANALOG LEFT/RIGHT CALIBRATION MENU

**CAUTION****CAUTION**

CALIBRATION CANNOT BE PERFORMED DURING ON-AIR OPERATION. THE AUDIO SOURCE TO BE CALIBRATED WILL TEMPORARILY BE THE ACTIVE PRIMARY SOURCE DURING THE PROCESS.

1. The left/right source can be calibrated using two methods. One method is to select left/right as the primary source. This allows the level to be viewed and remain on the meter during the entire calibration process. The second method is to not select the left/right source as the primary. In this case, the unit will automatically switch and select the left/right source as the primary. The levels will appear on the meter only during the actual calibration process. When the calibration process is finished, the unit will automatically return to the selected primary source.
2. Ensure the exciter is off the air and from Audio Input Menu depress L&R CAL. The Analog Left/Right Calibration Menu will appear.
3. Prior to calibrating the analog left/right signal, the desired modulation deviation must be assigned. If the modulation deviation has not been assigned, access the menu by using the MOD SETUP button on the Audio Input Menu and assign the desired modulation deviation.
4. Ensure all internal and external SCA/RBDS signals are disabled.
5. Refer to Figure 2-3. Apply the analog left/right audio source to the FXi at a nominal level of +10 dBm. The input level range is from 0 dBm to +11 dBm.
6. Depress CAL L&R. A Calibrating Now message will appear during the calibration process. The level will appear on the meter.
7. If desired, the level can be adjusted manually by pressing the LEFT CH LOWER, LEFT CH RAISE, RIGHT CH LOWER, and RIGHT CH RAISE so that the indicated level on both bars is 100. If an exact meter indication is not obtained, adjust the input level from the external source slightly to achieve the desired meter indication.
8. When finished, depress BACK.

3.18.6 EXTERNAL SCA/RBDS SETUP AND CALIBRATION.

An external SCA or RBDS signal can be used with the FXi if desired. An external SCA/ RBDS signal is setup and calibrated using the CAL SCA/RBDS button on the Audio Input menu (refer to Figure 3-35). The setup menu allows the external input to be enabled/ disabled and the injection level to be assigned. The calibration procedure compensates for level variations in the signal. The default parameters are: 1) operating mode - off and 2) level - 10%. To calibrate the external SCA/RBDS source, proceed as follows:

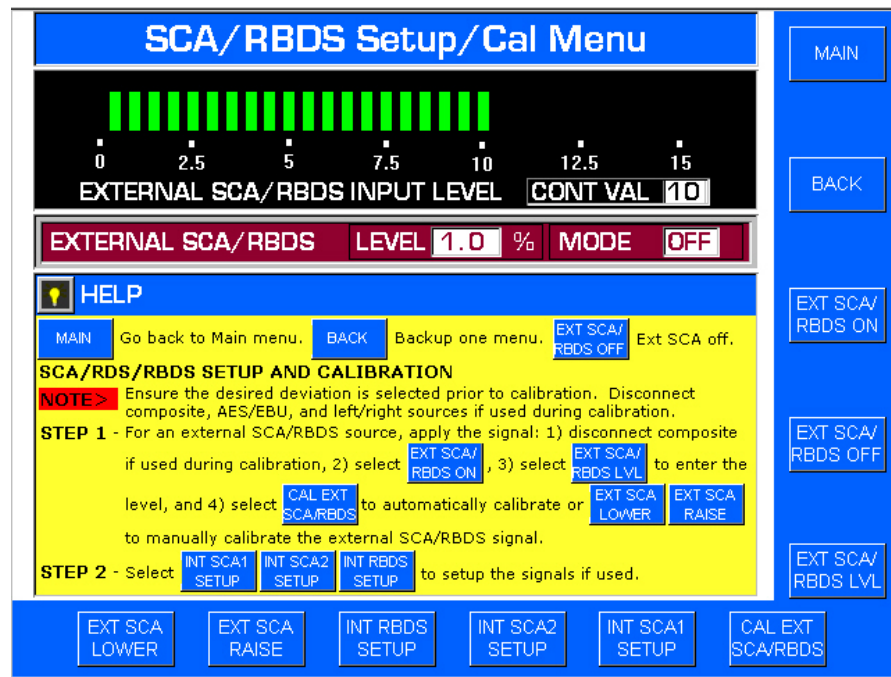


Figure 3-35. EXTERNAL SCA/RBDS SETUP/CAL MENU



NOTE

ENSURE THE MODULATION DEVIATION IS SELECTED BEFORE PROCEEDING. DISCONNECT THE COMPOSITE SOURCE DURING CALIBRATION IF USED.



CAUTION

CAUTION

CALIBRATION CANNOT BE PERFORMED DURING ON-AIR OPERATION. THE AUDIO SOURCE TO BE CALIBRATED WILL TEMPORARILY BE THE ACTIVE PRIMARY SOURCE DURING THE PROCESS.

1. Refer to Figure 2-4, Figure 2-2, and Figure 2-3 for input locations. The main-channel audio source (COMPOSITE, AES/EBU, or LEFT/RIGHT) input source must be disconnected during the SCA/RBDS calibration process. If these sources are used, temporarily disconnect the sources.
2. Ensure the exciter is off-the-air and, from the Audio Input Menu, depress SCA/ RBDS SETUP. The SCA/RBDS Setup/Cal Menu will appear (refer to Figure 3-35).

3. To enable external SCA/RBDS operation, depress EXT SCA/RBDS ON. To disable RBDS operation, depress EXT SCA/RBDS OFF. The selected external SCA/RBDS operating mode will appear in the EXTERNAL SCA/RBDS status display.
4. To program the external SCA/RBDS level, proceed as follows:

A. Depress EXT SCA/RBDS LVL. The External SCA/ RBDS Level Menu will appear (refer to Figure 3-36).

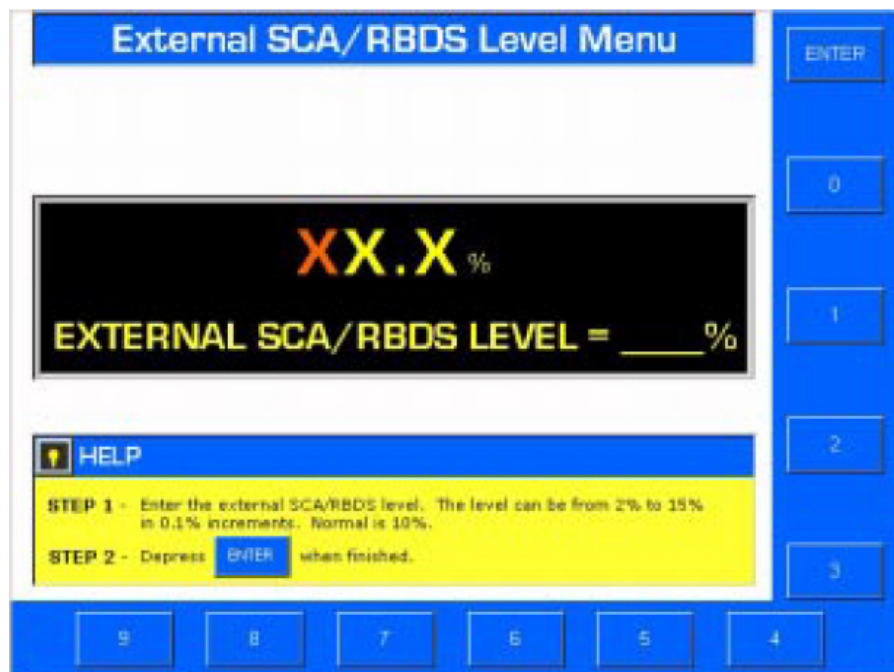


Figure 3-36. EXTERNAL SCA/RBDS LEVEL MENU

- B. Using the menu numeric keys, enter the desired level. The level can be from 2% to 15% in 0.1% increments. If a data entry error occurs, depress ENTER at any time to back up to the previous menu. The data will not be saved until the correct number of digits (2 for levels below 9.9% and 3 for levels above 10%) are entered and the ENTER button is depressed. Example – 2.5 or 10.5.
- C. When finished, depress ENTER. The selected level appears in the EXTERNAL SCA/RBDS LEVEL status display. Prior to calibrating the external SCA/RBDS signal, the desired modulation deviation must be assigned. If the modulation deviation has not been assigned, access the MOD menu and assign the desired modulation deviation.
5. Ensure all internal SCA/RBDS signals are disabled.
6. Refer to Figure 2-6. Apply the external SCA/RBDS source to the FXi at a nominal level of 3.5 volts peak-to-peak. The input level range is from 1.0 to 4.0 volts peak-to-peak.
7. Depress CAL EXT SCA/RBDS. A CALIBRATING NOW message will appear during the calibration process. The level will appear on the meter.
8. If desired, the level can be adjusted manually by pressing the EXT SCA LOWER and EXT SCA RAISE so that the indicated level is the same as the selected level which is displayed in the EXTERNAL SCA/RBDS LEVEL status display (typically 10.0%). If an exact meter indication is not obtained, adjust the input level from the external source slightly to achieve the desired meter indication.
9. The internal SCA and RBDS menus can be accessed from the External SCA/ RBDS Setup/Cal Menu if desired. Depress: 1) INT SCA1 SETUP to configure SCA1, 2) INT SCA2 SETUP to configure SCA2, or 3) INT RBDS SETUP to configure the internal RBDS source.
10. When finished, depress BACK. Reconnect the sources which were disconnected in step 1.

3.18.7 COMPOSITE CALIBRATION.

If a composite audio source is to be used with the FXi, the source must be calibrated (refer to Figure 3-37). This calibration procedure compensates for level variations in the source. To calibrate the composite source, proceed as follows:

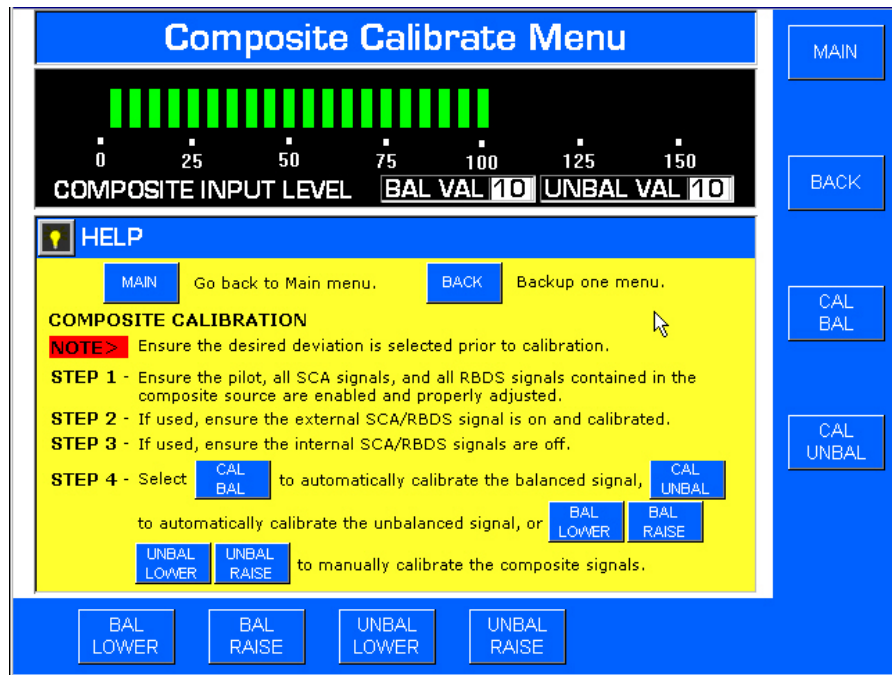


Figure 3-37. COMPOSITE CALIBRATE MENU



NOTE

ENSURE THE MODULATION DEVIATION IS SELECTED BEFORE PROCEEDING. ENSURE THE PILOT, SCA SIGNALS, AND RBDS SIGNALS USED IN THE COMPOSITE SOURCE ARE ENABLED. ENSURE ALL INTERNAL SCA/RBDS SIGNALS ARE DISABLED. IF USED, ENSURE THE EXTERNAL SCA/RBDS SOURCE IS CALIBRATED AND ENABLED PRIOR TO PERFORMING THE FOLLOWING PROCEDURE.

NOTE



CAUTION

CAUTION

CALIBRATION CANNOT BE PERFORMED DURING ON-AIR OPERATION. THE AUDIO SOURCE TO BE CALIBRATED WILL TEMPORARILY BE THE ACTIVE PRIMARY SOURCE DURING THE PROCESS.

1. The composite source can be calibrated using two methods. One method is to select composite as the primary source. This allows the level to be viewed and remain on the meter during the entire calibration process. The second method is to not select the composite source as the primary. In this case, the unit will automatically switch and select the composite source as the primary. The levels will appear on the meter only during the actual calibration process. When the calibration process is finished, the unit will automatically return to the selected primary source.
2. Refer to Figure 2-6. The external SCA/RBDS input source if used must be connected and calibrated prior to composite calibration. If the external SCA/RBDS input is used, ensure the source is calibrated and enabled.
3. Ensure the exciter is off the air and, from the Audio Input Menu, depress COMP CAL. The Composite Calibration Menu will appear (refer to Figure 3-37).
4. Prior to calibrating the composite signal, the desired modulation deviation must be assigned. If the modulation deviation has not been assigned, access the menu by using the MOD SETUP button on the Audio Input Menu and assign the desired modulation deviation.
5. Ensure all internal SCA/RBDS signals are disabled.
6. Refer to Figure 2-4. Connect the composite source to the BAL COMP or UNBAL COMP connector. Apply the composite audio source to the FXi at a nominal level of 3.5 volts peak-to-peak. The input level range is from 1.0 to 4.0 volts peak-to-peak.
7. If the source is connected to the BAL COMP connector, depress CAL BAL. If the source is connected to the UNBAL COMP connector, depress CAL UNBAL. A CALIBRATING NOW message will appear during the calibration process. The level will appear on the meter.
8. If desired, the level can be adjusted manually by pressing the BAL LOWER, BAL RAISE, UNBAL LOWER, and UNBAL RAISE so that the indicated level on both bars is 100. If an exact meter indication is not obtained, adjust the input level from the external source slightly to achieve the desired meter indication.
9. When finished, depress BACK. Reconnect the SCA/RBDS input, if used.

3.19 PASSWORD – EDITING.

The FXi is equipped with a security system. This system prevents access to any screen other than the main menu. The exciter is equipped with a default password to allow entry into the security system. Once the default password is entered, the password can be changed to any 4 to 6 digit number using digits 0 through 7. If the password is to be changed, proceed as follows:

1. Ensure the user is logged into the FXi. If the user must log in using the default password, proceed as follows:
 - A. On the Main Menu, depress LOG IN.
 - B. Use the menu numeric keys to enter: 123456 (default from the factory)
 - C. Depress ENTER.

The LOG IN button will change to LOG OUT on the Main Menu.

2. Depress LOG OUT. The Log Out Menu will appear (refer to Figure 3-38).
3. Depress EDIT PASSWD. The Edit Password Menu will appear (refer to Figure 3-39).
4. Using the menu numeric keys, enter the desired password. The password can be from 4 to 6 digits in length.
5. Depress ENTER. The Confirm Edit Password Menu will appear (refer to Figure 3-40).
6. Using the Confirm Edit Password Menu numeric keys, re-enter the desired password.
7. Depress ENTER.

The password will be changed.



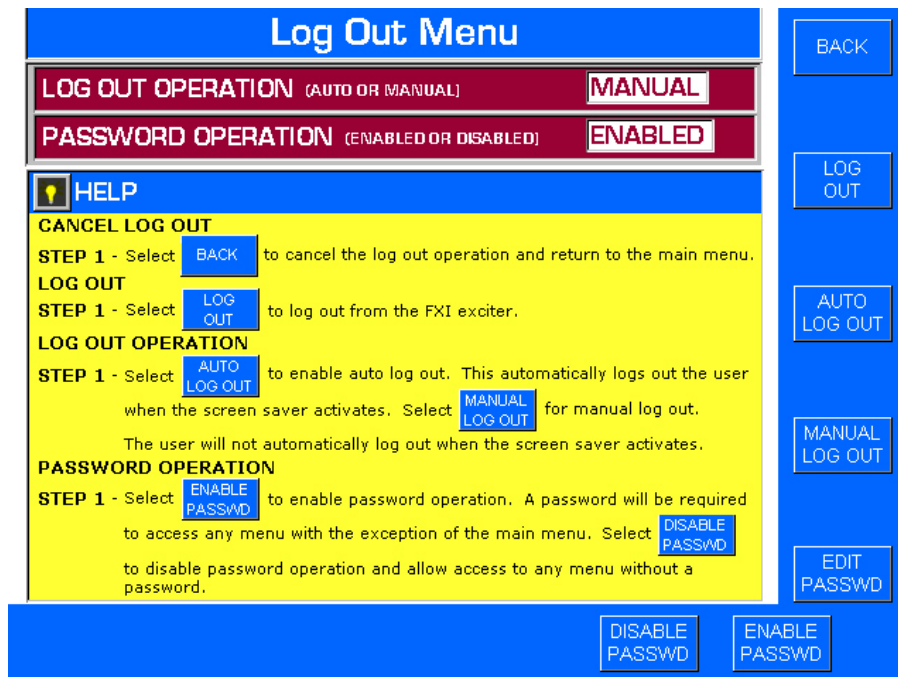


Figure 3-38. LOG OUT MENU

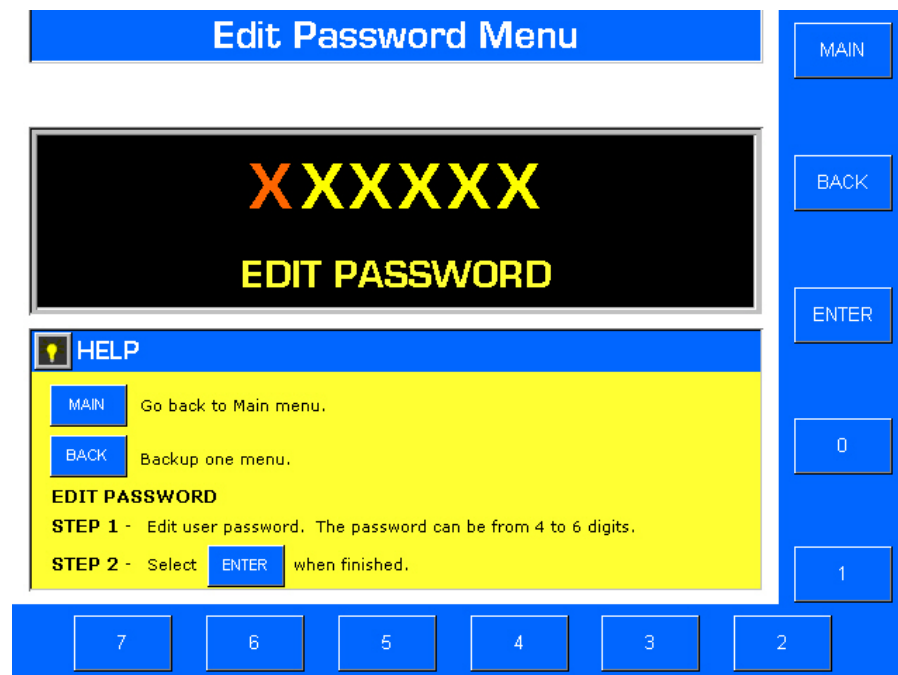


Figure 3-39. EDIT PASSWORD MENU



Figure 3-40. CONFIRM EDIT PASSWORD MENU

3.20 SCREEN SAVER OPERATION.

The FXi is equipped with a screen saver. The screen saver will automatically blank the LCD screen after approximately 15 minutes. This prevents damage to the screen during long periods of inactivity. To re-enable the screen, depress any front-panel switch. If password operation is enabled and auto log out operation is selected, the FXi main menu will appear and the user will be logged out (refer to LOG OUT OPERATION - MANUAL OR AUTOMATIC in the following text). If password operation is disabled or manual log out is selected, the menu will re-appear and the user will not be logged out.

3.21 LOG OUT OPERATION – MANUAL OR AUTOMATIC.

The FXi can be configured to automatically or manually log out from the security system (refer to Figure 3-38). Log out configures the FXi to the main menu and prevents access to additional menus. If automatic log out is selected, the FXi will automatically log out when the screen saver activates (approximately 15 minutes). If manual log out is selected, the user must manually log out using the LOG OUT button. This feature is designed to prevent a trip back to the transmitter site if the user inadvertently forgets to log out when finished. Typically, log out is configured to AUTO. If an exciter ac power interruption occurs, the exciter will automatically log out. To select the desired log out operation, proceed as follows:

1. On the Main Menu, depress LOG OUT. The Log Out Menu will appear (refer to Figure 3-38).
2. To select automatic log out, depress AUTO LOG OUT. AUTO will appear in the Log Out Operation display (refer to Figure 3-38).
3. To select manual log out, depress MANUAL LOG OUT. MANUAL will appear in the Log Out Operation display (refer to Figure 3-38).

3.22 PASSWORD OPERATION – ENABLED OR DISABLED.

The FXi security system can be enabled or disabled (refer to Figure 3-38). If password operation is enabled, the user will be required to log in. This will prevent access to menus from unauthorized personnel. If password operation is disabled, the user will not be required to log in. Any user will be able to access any menu. This feature is designed to temporarily disable the security system during maintenance periods. To select the desired password operation, proceed as follows:

1. On the Main Menu, depress LOG OUT. The Log Out Menu will appear (refer to Figure 3-38).
2. To enable password operation, depress ENABLE PASSWD. ENABLED will appear in the Password Operation display (refer to Figure 3-38).
3. To disable password operation, depress DISABLE PASSWD. DISABLED will appear in the Password Operation display (refer to Figure 3-38).

3.23 RAISE/LOWER POWER.

The PA Power Menu is used to adjust the FXi output power (refer to Figure 3-41). In some IBOC modes the raise/lower buttons are not active and they will grey out. To raise or lower the exciter output power, proceed as follows:

1. On the Main Menu, depress PA/POWER. The PA/Power Menu will appear (refer to Figure 3-41).
2. To raise the output power: 1) depress/release RAISE POWER to increase the output power in small increments or 2) depress and hold RAISE POWER to increase the output power rapidly. The exciter forward power will be presented on the FWD PWR display. The exciter reflected power will be presented on the RFL PWR display.

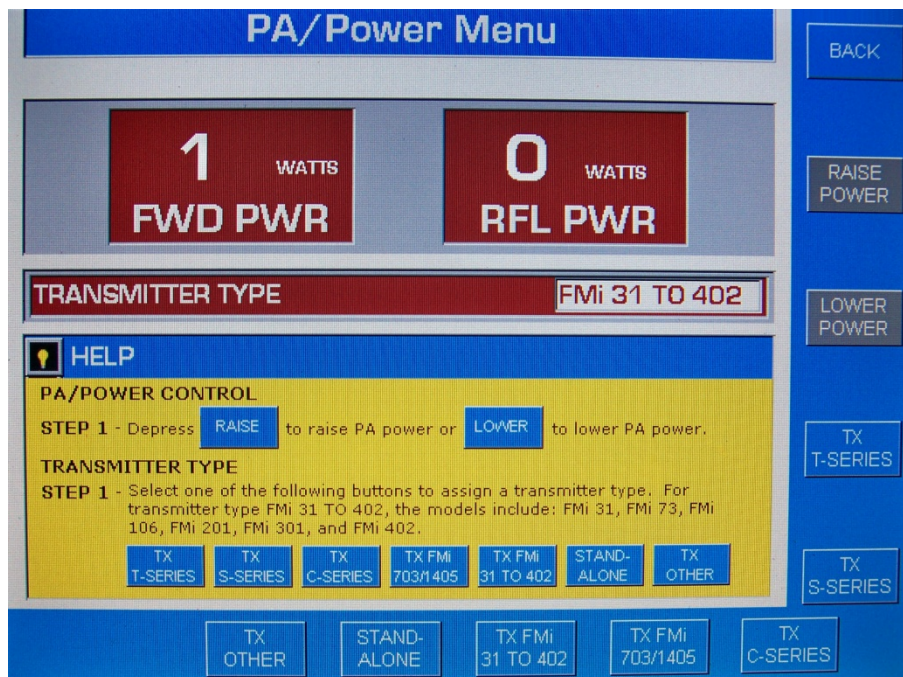


Figure 3-41. PA POWER MENU

3. To lower the output power, depress LOWER POWER to decrease the output power. The exciter forward power will be presented on the FWD PWR display. The exciter reflected power will be presented on the RFL PWR display.

3.24 SETTING TRANSMITTER TYPE.

Refer to Figure 3-42. The FXi can be used with several PA types. The PA/Power Menu provides a means of selecting the PA type (or stand alone) which will be used with the exciter. In order to use this feature you must know the PA type in which the exciter is to be located.

1. While in the PA/Power menu, depress the appropriate PA choice: TX T-SERIES, TX S-SERIES, TX C-SERIES, TX FMI703/1405, TX FMI31 to 402, STAND-ALONE or TX OTHER. The selected transmitter type appears in the TRANSMITTER TYPE status display.
2. Depress BACK to return to the Main Menu.

3.25 MANUAL LOG OUT.

If manual log out operation is selected and password operation is enabled, the user will be required to log out. When the user logs in, the LOG IN button on the Main Menu will change to LOG OUT (refer to Figure 3-42). To log out, proceed as follows:

1. Depress LOG OUT. The Log Out Menu will appear (refer to Figure 3-42).
2. Depress LOG OUT. The Main Menu will appear and the LOG OUT button will change to LOG IN. The user will be required to enter a password and log in to access any menu with the exception of the Main Menu.

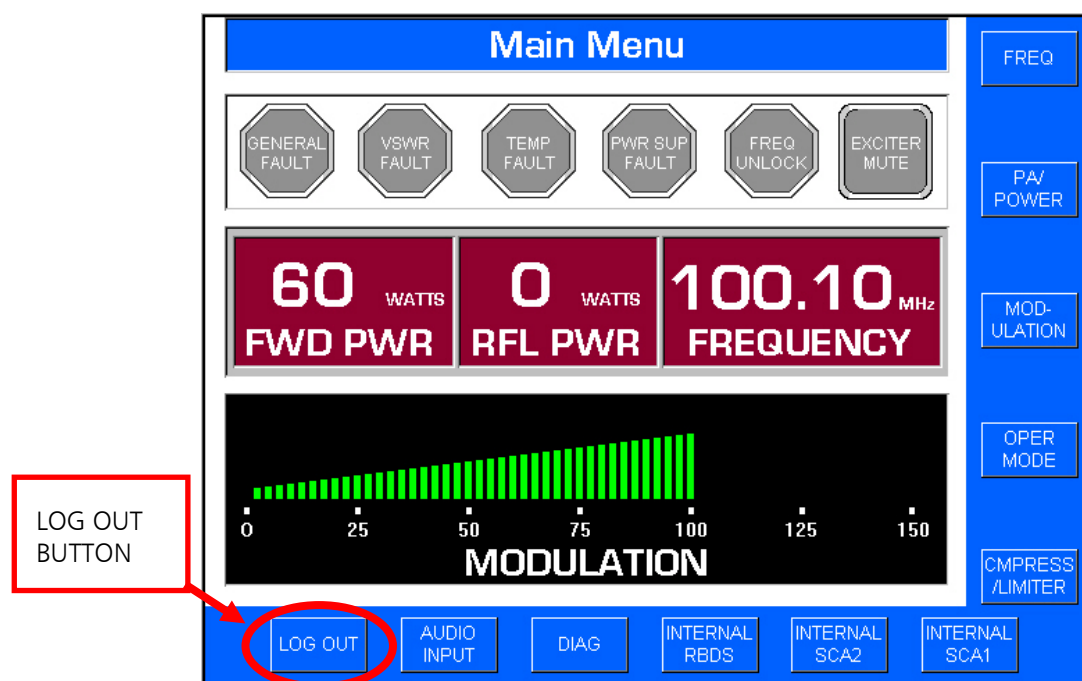


Figure 3-42. LOG OUT

3.26 FAULT DISPLAY AND DIAGNOSTICS.

The FXi is equipped with displays to indicate and troubleshoot fault conditions. Refer to the Maintenance section for a complete description of the fault and diagnostics displays.

3.27 RBDS/RDS DATA ENTRY.

Data is entered into the internal RBDS/RDS generator using a personal computer and any standard communication program such as Windows HyperTerminal. A standard null modem cable (BE P/N 849-9091) must be connected between FXi SERIAL PORT J10 and the computer serial port (refer to Figure 3-43). Once the cable is connected, the communication program parameters must be configured. The following text presents the procedure to configure the program parameters using Windows HyperTerminal. If a different communication program is used, refer to the program instruction manual to configure the communication parameters.

3.27.1 FXi/PC CONNECTIONS.

A standard null modem cable (BE P/N 849-9091) must be connected between FXi SERIAL PORT J10 and the computer serial port. Refer to Figure 3-44 and connect the null modem cable between FXi SERIAL PORT J10 and the computer serial port. If a null modem cable cannot be located, refer to Figure 3-44 and construct a cable as shown.

3.27.2 COMMUNICATION PROGRAM SETUP.

The following text presents the procedure to configure the communication program parameters using Windows 95 HyperTerminal. If a different communication program is used, refer to the program instruction manual to configure the communication parameters.

1. Move the cursor to the Start button on the Windows desktop and click the mouse.
2. Move the cursor to PROGRAMS/ACCESSORIES/HYPERTERMINAL and click the mouse.
3. Move the cursor to the HYPERTERMINAL shortcut and double-click the mouse. The HYPERTERMINAL program will appear.
4. In the CONNECTION DESCRIPTION dialog box, enter the name of the shortcut to be created such as FXi RBDS.
5. Use the mouse to select the desired icon.
6. Move the cursor to OK and click the mouse. The CONNECT TO dialog box will appear.
7. In the CONNECT USING dialog box, ensure the correct COM port is selected. Typically, COM1 is used.
8. Move the cursor to OK and click the mouse. The COM1 PROPERTIES dialog box will appear.
9. Move the cursor to the BITS PER SECOND dialog box and select 19200.
10. Move the cursor to the DATA BITS dialog box and select 8.
11. Move the cursor to the PARITY dialog box and select NONE.
12. Move the cursor to the STOP BITS dialog box and select 1.
13. Move the cursor to the FLOW CONTROL dialog box and select NONE.
14. Move the cursor to OK and click the mouse.



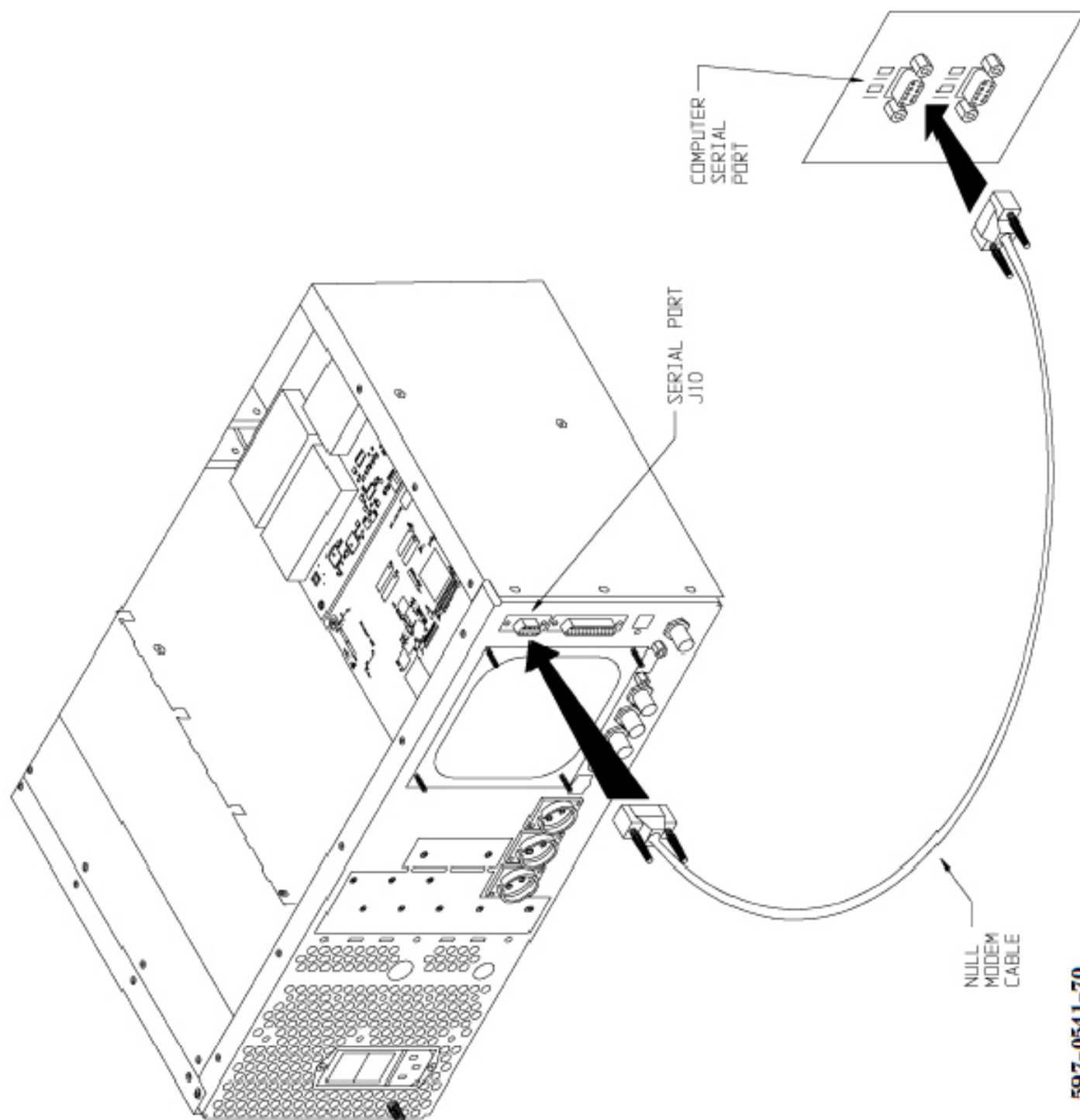
**597-0541-70**

Figure 3-43. RBDS/RDS PROGRAMMING CONNECTIONS

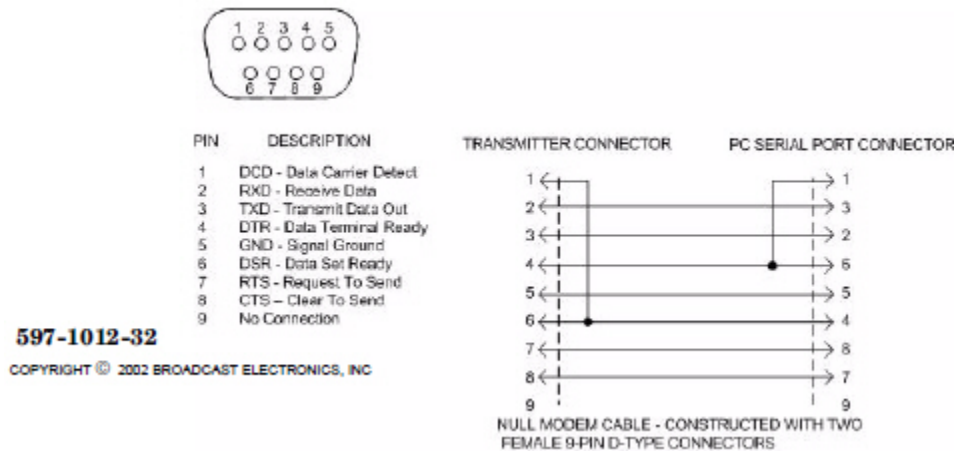


Figure 3-44. NULL MODEM CABLE CONSTRUCTION

3.27.3 DATA ENTRY.

The following procedure assumes that PC communications have been established. To enter rbds/rda data, proceed as follows:

1. Depress Enter. The RBDS/RDS data entry menu will appear (refer to Figure 3-45).

This application will assist in entering the data needed to code the internal RBDS system. Before beginning, please read the section in the instruction manual that explains this application. The following menu allows access to all the data that can be sent using this implementation of RBDS. Please enter all the data fields that you wish to use.

Type the menu entry hot key to select which data to enter
 h = Hexadecimal entry of the Program Identification (PI) code
 c = Call letter entry for the Program Identification (PI) code
 t = Program type (PTY) code entry, 0-31
 1-7 = Entry for alternate frequencies 1 through 7
 n = Program service name entry, 8 characters
 v = View and save all settings

Figure 3-45. RBDS/RDS DATA ENTRY MENU

2. The PI (Program Identification) code is the station identification (call letters in the U.S.). For U.S. RBDS stations with 4 character identification, the code is calculated by the software using the entered call letters for the station. For U.S. RBDS systems with 3 character call letters, the code is determined by Table 3-5 and the h command detailed below section B. For European RDS systems utilize the h command detailed below in section B.
 - A. For U.S. RBDS stations with 4 character identification (call letters), proceed as follows:
 1. Depress c. The PI call letter menu will appear (refer to Figure 3-46).
 2. Enter the station identification (call letters). The letters can be either upper or lower case. The menu will display all upper case letters.

```
Type the menu entry hot key to select which data to enter
h = Hexadecimal entry of the Program Identification (PI) code
c = Call letter entry for the Program Identification (PI) code
t = Program type (PTY) code entry, 0-31
1-7 = Entry for alternate frequencies 1 through 7
n = Program service name entry, 8 characters
v = View and save all settings
c
Please enter the 4 character call letters:
```

Figure 3-46. PI CALL LETTER ENTRY MENU

- B. For U.S. RBDS stations with 3-character call letters, or European RDS PI entry proceed as follows:
1. Depress h. The PI code entry menu will appear (refer to Figure 3-47).
 2. For U.S. RBDS stations with 3-character call letters Refer to Table 3-5 and determine the code.
 3. For European RDS stations enter the 4-character hexadecimal code which indicates the country, coverage area, and program type.
 4. Enter the hexadecimal code.

```
Type the menu entry hot key to select which data to enter
h = Hexadecimal entry of the Program Identification (PI) code
c = Call letter entry for the Program Identification (PI) code
t = Program type (PTY) code entry, 0-31
1-7 = Entry for alternate frequencies 1 through 7
n = Program service name entry, 8 characters
v = View and save all settings
h
Please enter the 4 character hexadecimal value for the PI code:
```

Figure 3-47. PI CODE ENTRY MENU

Table 3-5. 3-LETTER PROGRAM IDENTIFICATION CODES

CALL LETTERS	PI CODE	CALL LETTERS	PI CODE	CALL LETTERS	PI CODE
KBW	99A5	KOY	9992	WHO	9978
KCY	99A6	KPQ	9993	WHP	999C
KDB	9990	KQV	9964	WIL	999D
KDF	99A7	KSD	9994	WIP	997A
KEX	9950	KSL	9965	WIS	99B3
KFH	9951	KUJ	9966	WJR	997B
KFI	9952	KUT	9995	WJW	99B4
KGA	9953	KVI	9967	WJZ	99B5
KGB	9991	KWG	9968	WKY	997C
KGO	9954	KXL	9996	WLS	997D
KGU	9955	KXO	9997	WLW	997E
KGW	9956	KYW	996B	WMC	999E

KGY	9957	WBT	9999	WMT	999F
KHQ	99AA	WBZ	996D	WOC	9981
KID	9958	WDZ	996E	WOI	99A0
KIT	9959	WEW	996F	WOL	9983
KJR	995A	WGH	999A	WOR	9984
KLO	995B	WGL	9971	WOW	99A1
KLZ	995C	WGN	9972	WRC	99B9
KMA	995D	WGR	9973	WRR	99A2
KMJ	995E	WGY	999B	WSB	99A3
KNX	995F	WHA	9975	WSM	99A4
KOA	9960	WHB	9976	WWJ	9988
KOB	99AB	WHK	9977	WWL	9989

In order to continue you must know the program type codes for the station which you are programming.

3. Enter the program type as follows:

- A. For RDS systems, refer to Table 3-6 and Table 3-7 and select the program type code. For RDS systems, refer to Table 3-8 and Table 3-9 and select the program type code. Select the code that matches the program material to be broadcast.
- B. Depress t. The PTY code entry menu will appear (refer to Figure 3-48).
- C. Enter the code. For codes 1 thru 3, depress Enter.

```
Type the menu entry hot key to select which data to enter
h = Hexadecimal entry of the Program Identification (PI) code
c = Call letter entry for the Program Identification (PI) code
t = Program type (PTY) code entry, 0-31
1-7 = Entry for alternate frequencies 1 through 7
n = Program service name entry, 8 characters
v = View and save all settings
t
Please enter a number from 0 to 31 for the PTY code:
```

Figure 3-48. PROGRAM PTY CODE ENTRY MENU



Table 3-6. RBDS (U.S.) PROGRAM TYPE CODES

NUMBER	PROGRAM TYPE	8 CHARACTER DISPLAY	16 CHARACTER DISPLAY
0	No program type or undefined	None	None
1	News	News	News
2	Information	Inform	Information
3	Sports	Sports	Sports
4	Talk	Talk	Talk
5	Rock	Rock	Rock
6	Classic Rock	Cls_Rock	Classic_Rock
7	Adult Hits	Adlt_Hit	Adult_Hits
8	Soft Rock	Soft_Rck	Soft_Rock
9	Top 40	Top_40	Top_40
10	Country	Country	Country
11	Oldies	Oldies	Oldies
12	Soft	Soft	Soft
13	Nostalgia	Nostalgia	Nostalgia
14	Jazz	Jazz	Jazz
15	Classical	Classicl	Classical
16	Rhythm And Blues	R_&_B	Rhythm_and_Blues
17	Soft Rhythm And Blues	Soft_R_&_B	Soft_R_&_B
18	Foreign Language	Language	Foreign_Language
19	Religious Music	Rel_Musc	Religious_Music
20	Religious Talk	Rel_Talk	Religious_Talk
21	Personality	Persnlty	Personality
22	Public	Public	Public
23	College	College	College
24 thru 28	Unassigned	N/A	N/A
29	Weather	Weather	Weather
30	Emergency Test	Test	Emergency_Test
31	Emergency	ALERT!	ALERT!_ALERT!



Table 3-7. EXPLANATION OF RBDS (U.S.) PROGRAM TYPES

NUMBER	PROGRAM TYPE	16 CHARACTER DISPLAY
1	News	News reports, either local or network in origin.
2	Information	Programming that is intended to impart advice.
3	Sports	Sports reporting, commentary, and/or live event coverage, either local or network in origin.
4	Talk	Call-in and/or interview talk shows either local or national in origin.
5	Rock	Album cuts.
6	Classic Rock	Rock oriented oldies, often missed with hit oldies, from a decade or more ago.
7	Adult Hits	An up-tempo contemporary hits format with no hard rock and no rap.
8	Soft Rock	Album cuts with a generally soft tempo.
9	Top 40	Current hits, often encompassing a variety of rock styles.
10	Country	Country music, including contemporary and traditional styles.
11	Oldies	Popular music, usually rock, with 80% or greater non-current music.
12	Soft	A cross between adult hits and classical, primarily non-current soft-rock originals.
13	Nostalgia	Big-band music.
14	Jazz	Mostly instrumental, includes both traditional jazz and more modern "smooth jazz".
15	Classical	Mostly instrumentals, usually orchestral or symphonic music.
16	Rhythm And Blues	A wide range of musical styles, often called "urban contemporary".
17	Soft Rhythm And Blues	Rhythm and blues with a generally soft tempo.
18	Foreign Language	Any programming format in a language other than English.



19	Religious Music	Music programming with religious lyrics.
20	Religious Talk	Call-in shows, interview programs, etc. with a religious theme.
21	Personality	A radio show where the on-air personality is the main attraction.
22	Public	Programming that is supported by listeners and/or corporate sponsors instead of advertising.
23	College	Programming produced by a college or university radio station.
24 thru 28	Unassigned	N/A
29	Weather	Weather forecasts or bulletins that are non-emergency in nature.
30	Emergency Test	Broadcast when testing emergency broadcast equipment or receivers. Not intended for searching or dynamic switching for consumer receivers. Receivers may, if desired, display "TEST" or "Emergency Test".
31	Emergency	Emergency announcement made under exceptional circumstances to give warning of events causing danger of a general nature. Not to be used for searching – only used in a receiver for dynamic switching.

Table 3-8. RDS (EUROPE) PROGRAM TYPE CODES

NUMBER	PROGRAM TYPE	8 CHARACTER DISPLAY	16 CHARACTER DISPLAY
0	No program type or undefined	None	None
1	News	News	News
2	Current Affairs	Affairs	Current Affairs
3	Information	Info	Information
4	Sport	Sport	Sport
5	Education	Educate	Education
6	Drama	Drama	Drama
7	Culture	Culture	Cultures
8	Science	Science	Science



9	Varied	Varied	Varied Speech
10	Pop Music	Pop M	Pop Music
11	Rock Music	Rock M	Rock Music
12	Easy Listening Music	Easy M	Easy Listening
13	Light Classical	Light M	Light Classics M
14	Serious Classical	Classics	Serious Classics
15	Other Music	Other M	Other Music
16	Weather	Weather	Weather & Metr
17	Finance	Finance	Finance
18	Children's Programs	Children	Children's Progs
19	Social Affairs	Social	Social Affairs
20	Religion	Religion	Religion
21	Phone In	Phone In	Phone In
22	Travel	Travel	Travel & Touring
23	Leisure	Leisure	Leisure & Hobby
24	Jazz Music	Jazz	Jazz Music
25	Country Music	Country	Country Music
26	National Music	National M	National Music
27	Oldies Music	Oldies	Oldies Music
28	Folk Music	Folk M	Folk Music
29	Documentary	Document	Documentary
30	Alarm Test	TEST	Alarm Test
31	Alarm	Alarm!	Alarm! – Alarm!

Table 3-9. EXPLANATION OF RDS (EUROPEAN) PROGRAM TYPES

NUMBER	PROGRAM TYPE	16 CHARACTER DISPLAY
1	News	Short accounts of facts, events, and publicly expressed views, reportage and actuality.
2	Current Affairs	Topical program expanding or enlarging upon the news, generally in different presentation style or concept, including debate, or analysis.



3	Information	Program the purpose of which is to impart advice in the widest sense.
4	Sport	Program concerned with any aspect of sport.
5	Education	Program intended primarily to educate, of which the formal element is fundamental.
6	Drama	All radio plays and serials.
7	Culture	Programs concerned with any aspect of national or regional culture, including language, theater, etc.
8	Science	Programs about the natural sciences and technology.
9	Varied	Used for mainly speech-based programs usually of light-entertainment nature, not covered by other categories. Examples include: quizzes, panel games, personality interviews.
10	Pop Music	Commercial music, which would generally be considered to be of current popular appeal, often featuring in current or recent record sales charts.
11	Rock Music	Contemporary modern music, usually written and performed by young musicians.
12	Easy Listening Music	Current contemporary music considered to be "easy-listening", as opposed to Pop, Rock, or Classical, or one of the specialized music styles, Jazz, Folk, or Country. Music in this category is often but not always, vocal, and usually short in duration.
13	Light Classics	Classical Musical for general, rather than specialist appreciation. Examples of music in this category are instrumental music, and vocal or choral works.
14	Serious Classics	Performances of major orchestral works, symphonies, chamber music etc., and including Grand Opera.
15	Other Music	Musical styles not fitting into any of the other categories. Particularly used for specialist music of which Rhythm & Blues and Reggae are examples.
16	Weather	Weather reports and forecasts and Meteorological information.

17	Finance	Stock Market reports, commerce, trading etc.
18	Children's Programs	For programs targeted at a young audience, primarily for entertainment and interest, rather than where the objective is to educate.
19	Social Affairs	Programs about people and things that influence them individually or in groups. Includes: sociology, history geography, psychology and society.
20	Religion	Any aspect of beliefs and faiths, involving a God or Gods, the nature of existence and ethics.
21	Phone In	Involving members of the public expressing their views either by phone or at a public forum.
22	Travel	Features and programs concerned with travel to near and far destinations, package tours and travel ideas and opportunities. Not for use for Announcements about problems, delays, or road works affecting immediate travel where TP/TA should be used.
23	Leisure	Programs concerned with recreational activities in which the listener might participate. Examples include, Gardening, Fishing, Antique collecting, Cooking, Food & Wine etc.
24	Jazz Music	Polyphonic, syncopated music characterized by improvisation.
25	Country Music	Songs which originate from, or continue the musical tradition of the American Southern States. Characterized by a straightforward melody and narrative story line.
26	National Music	Current Popular Music of the Nation or Region in that country's language, as opposed to International "Pop" which is usually US or UK inspired and in English.
27	Oldies Music	Music from the so-called "golden age" of popular music.
28	Folk Music	Music which has its roots in the musical culture of a particular nation, usually played on acoustic instruments. The narrative or story may be based on historical events or

		people.
29	Documentary	Program concerned with factual matters, presented in an investigative style.
30	Alarm Test	Broadcast when testing emergency broadcast equipment or receivers. Not intended for searching or dynamic switching for consumer receivers. Receivers may, if desired, display "TEST" or "Alarm Test".
31	Alarm	Emergency announcement made under exceptional circumstances to give warning of events causing danger of a general nature. Not to be used for searching – only used in a receiver for dynamic switching.

4. In order to continue you must know the frequencies of seven or fewer alternate broadcast stations. Typically, these are frequencies of related stations with similar material that the listener can tune to if the current station cannot be received. Enter the frequencies in the following format: 89.9 or 102.9.
 - A. Depress 1 to enter a frequency; enter 0 to erase a frequency. The alternate frequency entry menu will appear (refer to Figure 3-49).
 - B. Enter the frequency.
 - C. Repeat the procedure for up to 7 frequencies which will be retained.

```

This application will assist in entering the data needed to code the internal
RBDS system. Before beginning, please read the section in the instruction
manual that explains this application. The following menu allows access to
all the data that can be sent using this implementation of RBDS. Please
enter all the data fields that you wish to use.

Type the menu entry hot key to select which data to enter
h = Hexadecimal entry of the Program Identification (PI) code
c = Call letter entry for the Program Identification (PI) code
t = Program type (PTY) code entry, 0-31
1-7 = Entry for alternate frequencies 1 through 7
n = Program service name entry, 8 characters
v = View and save all settings
1

This implementation of RBDS allows coding of up to 7 alternate
frequencies. Alternate frequencies previously entered may also
be altered or erased using this menu entry.

Please enter alternate frequency number 1. Enter a value of 0
to erase the entry:

```

Figure 3-49. ALTERNATE FREQUENCY ENTRY MENU

This application will assist in entering the data needed to code the internal RBDS system. Before beginning, please read the section in the instruction manual that explains this application. The following menu allows access to all the data that can be sent using this implementation of RBDS. Please enter all the data fields that you wish to use.

Type the menu entry hot key to select which data to enter
 h = Hexadecimal entry of the Program Identification (PI) code
 c = Call letter entry for the Program Identification (PI) code
 t = Program type (PTY) code entry, 0-31
 1-7 = Entry for alternate frequencies 1 through 7
 n = Program service name entry, 8 characters
 v = View and save all settings
 n
 This menu selection allow the entry of an 8 character program service name.

Please enter the program service name:

Figure 3-50. PROGRAM SERVICE NAME ENTRY MENU

Type the menu entry hot key to select which data to enter
 h = Hexadecimal entry of the Program Identification (PI) code
 c = Call letter entry for the Program Identification (PI) code
 t = Program type (PTY) code entry, 0-31
 1-7 = Entry for alternate frequencies 1 through 7
 n = Program service name entry, 8 characters
 v = View and save all settings
 v
 PHex=0000 Program type code=00 Program service name=
 Alternate frequency 1=99.9
 Alternate frequency 2=102.2
 Alternate frequency 3=103.3
 Alternate frequency 4=104.4
 Alternate frequency 5=106.6
 Alternate frequency 6=107.7

Save and send settings to RBDS encoder? Type "y" or "n":

Figure 3-51. VIEW MENU



4 BLOCK DIAGRAMS

This section presents the block diagrams for the FXi digital FM/IBOC exciter.

4.1 FXi OVERALL BLOCK DIAGRAM.

Information on overall FXi operation is presented in Figure 4-1. Refer to Figure 4-1 for information on the overall operation of the exciter.

4.2 DSP CIRCUIT BOARD.

A block diagram of the DSP circuit board is presented in Figure 4-2. Refer to Figure 4-2 for information on the DSP circuit board circuitry.

4.3 CONTROLLER CIRCUIT BOARD.

A block diagram of the controller circuit board is presented in Figure 4-3. Refer to Figure 4-3 for information on the controller circuit board circuitry.

4.4 POWER SUPPLY CIRCUIT BOARD.

A block diagram of the power supply circuit board circuitry is presented in Figure 4-4. Refer to Figure 4-4 for information on the power supply circuit board circuitry.

4.5 POWER AMPLIFIER CIRCUIT BOARD.

A block diagram of the power amplifier module circuitry is presented in Figure 4-5. Refer to Figure 4-5 for information on the power amplifier circuit board circuitry.

4.5.1 POWER CONTROL

If the exciter is part of an FM-only system, output power is controlled by varying the 48-volt supply to the FXi PA.

If an IBOC signal is being passed in either an FM/IBOC mode or IBOC-only mode, the power supply voltage remains constant, while the level of the synthesized RF input to the PA is digitally controlled to cause the desired power output.

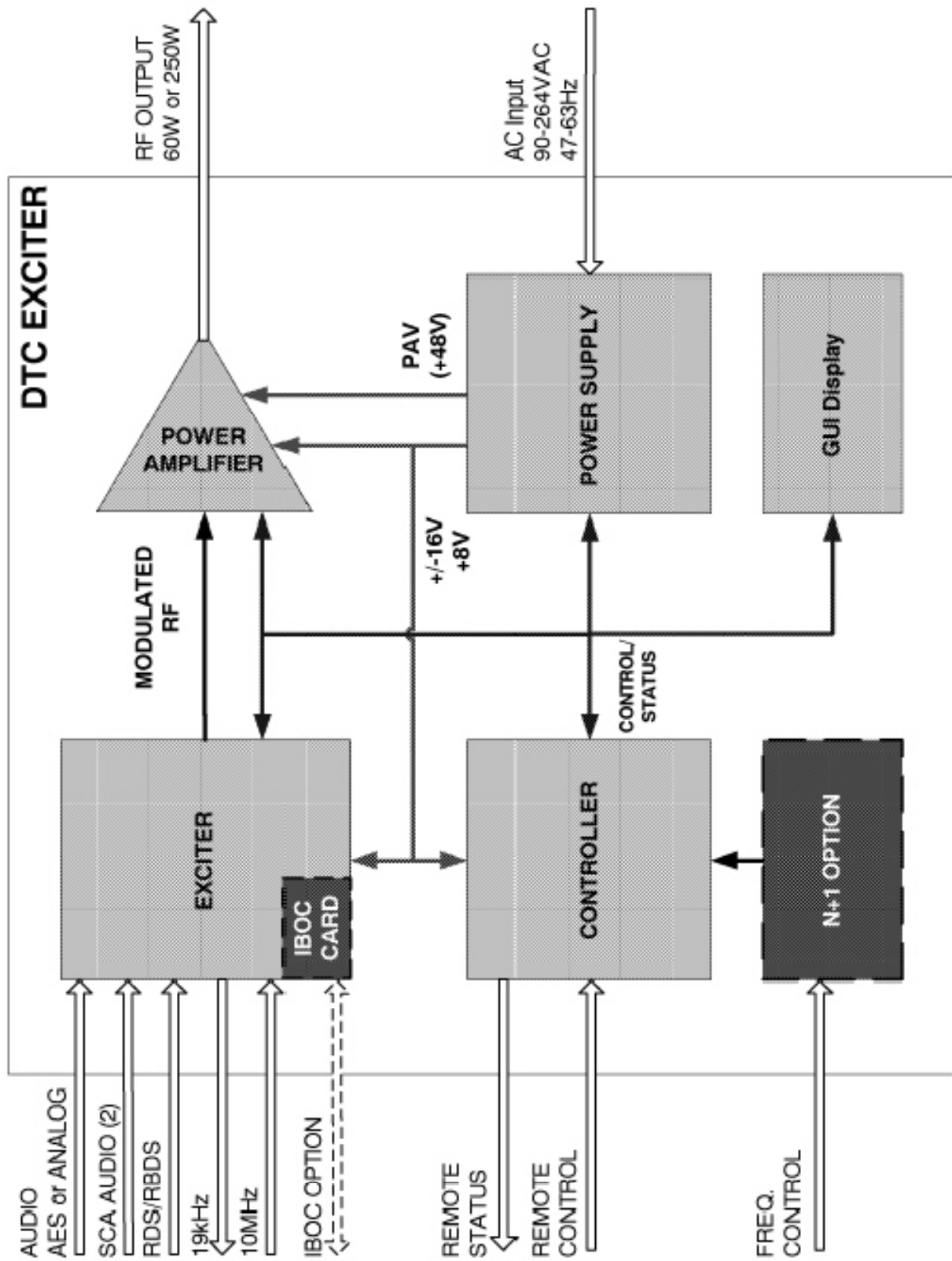


Figure 4-1. FXi OVERALL BLOCK DIAGRAM

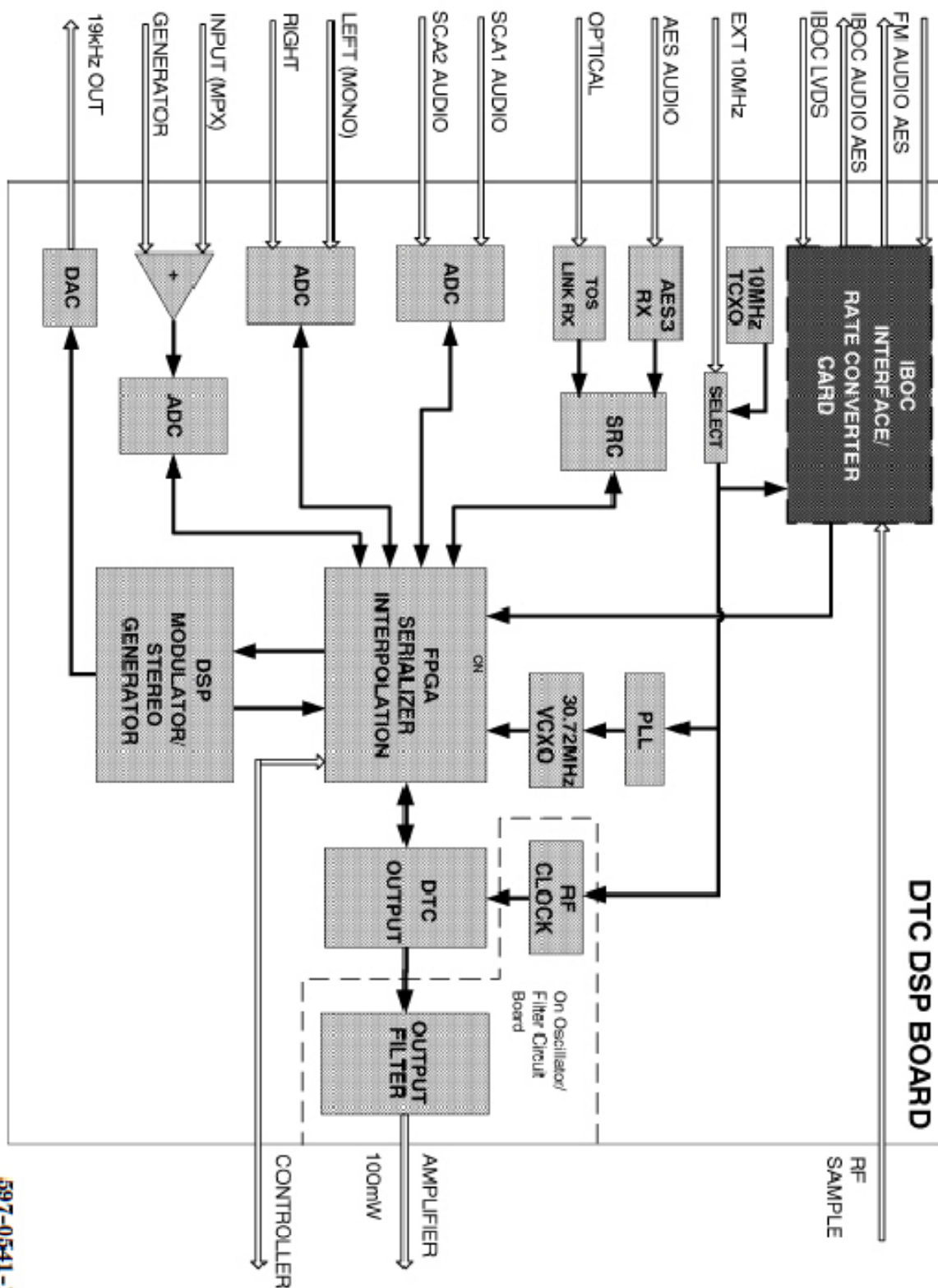


Figure 4-2. DSP CIRCUIT BOARD BLOCK DIAGRAM

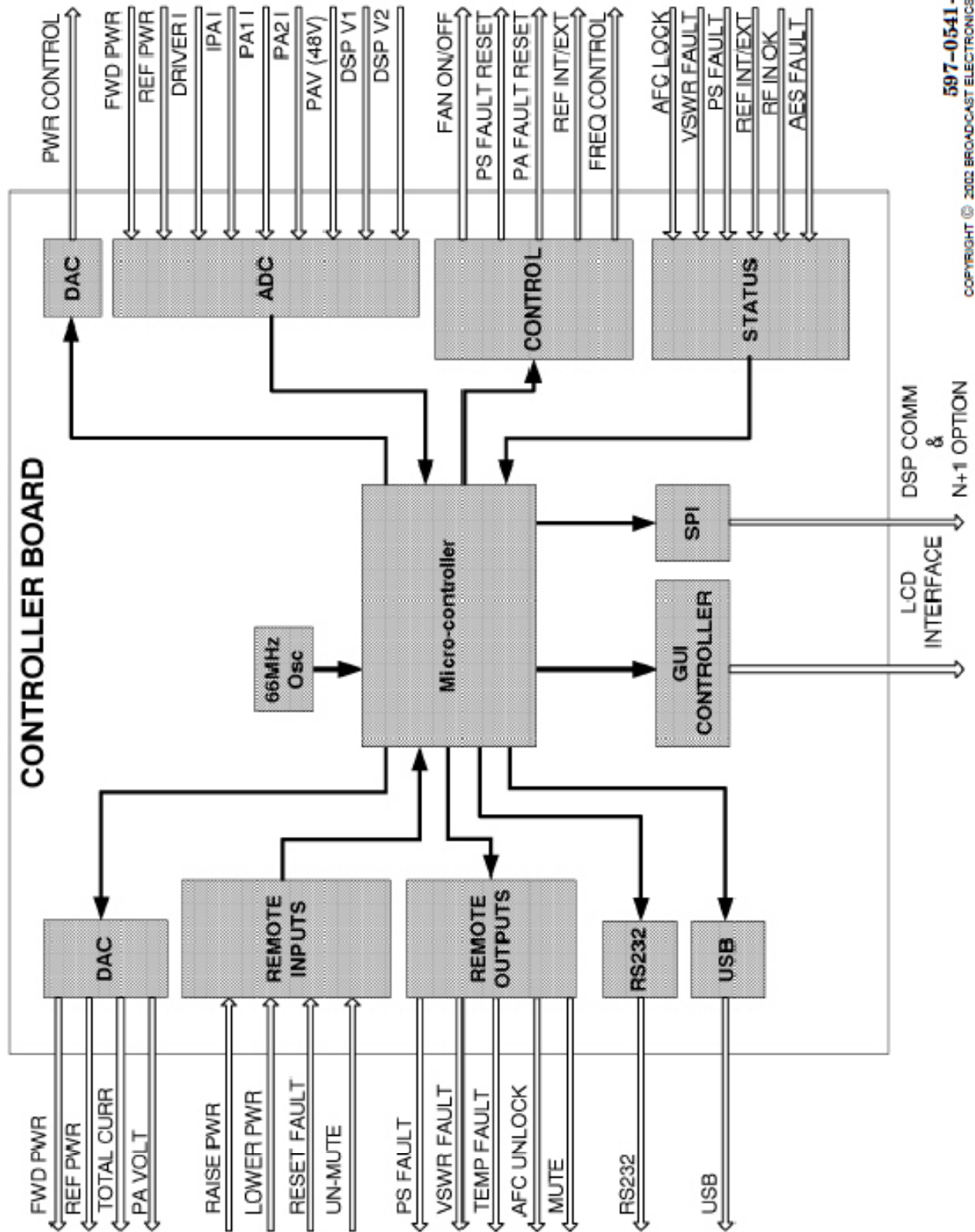


Figure 4-3. CONTROL CIRCUIT BOARD BLOCK DIAGRAM



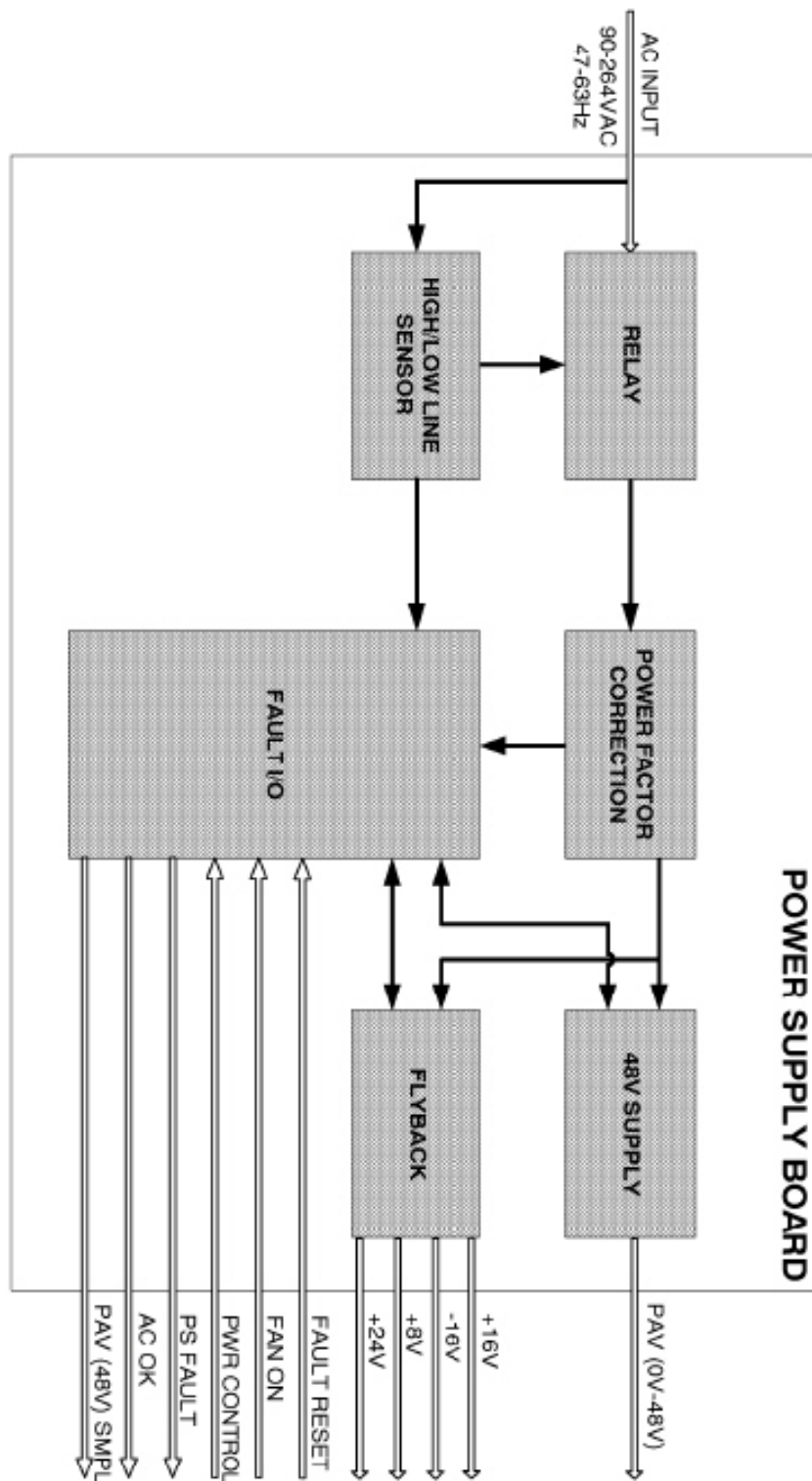


Figure 4-4. POWER SUPPLY CIRCUIT BOARD BLOCK DIAGRAM

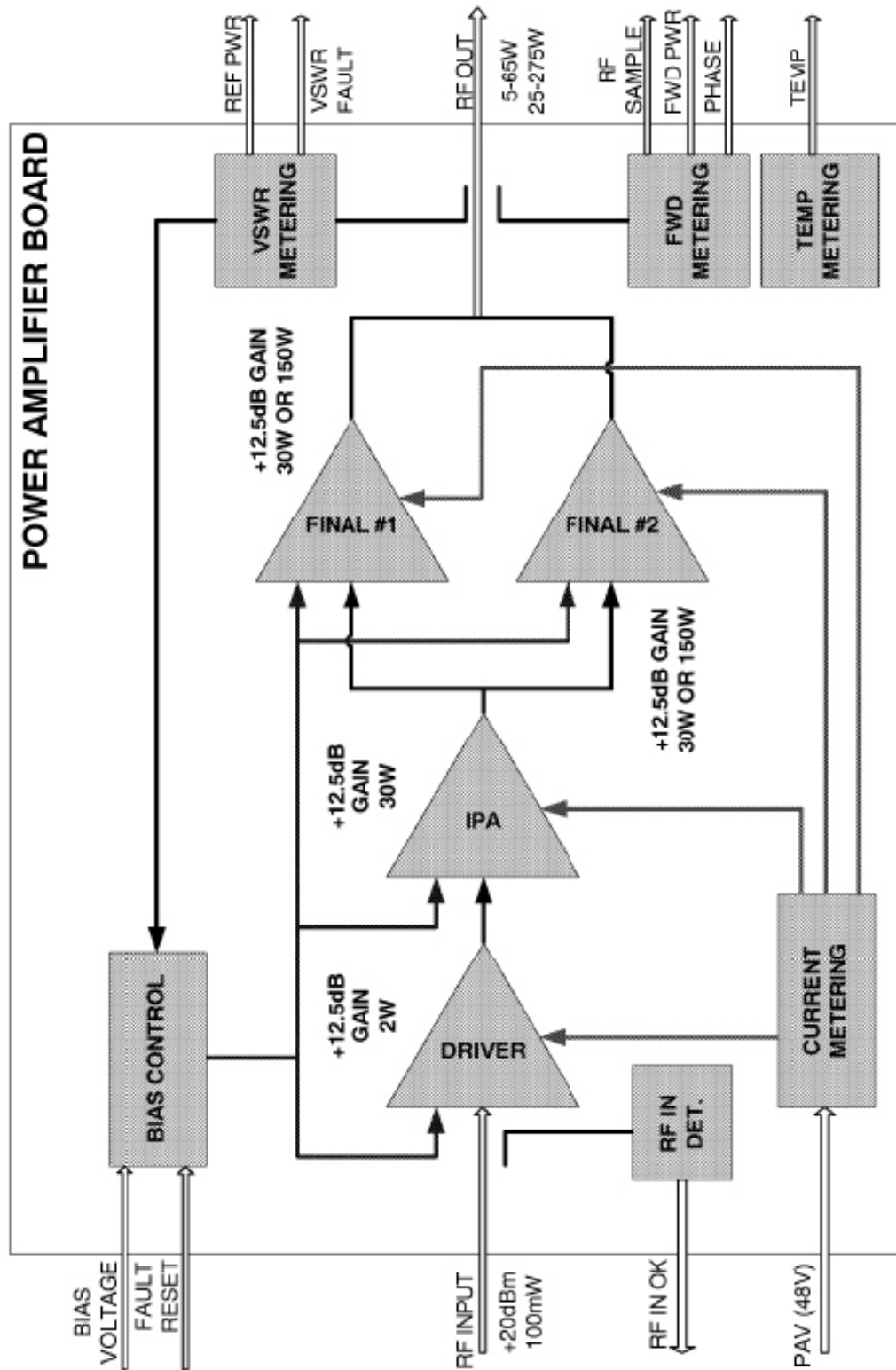


Figure 4-5. POWER AMPLIFIER CIRCUIT BOARD BLOCK DIAGRAM

5 MAINTENANCE

This section provides general maintenance information, electrical adjustment procedures, and troubleshooting information for the FXi digital FM exciter.

5.1 SAFETY CONSIDERATIONS.



WARNING

THE POWER SUPPLY CIRCUIT BOARD AND THE FRONT-PANEL SWITCH CIRCUIT BOARD CONTAIN HAZARDOUS VOLTAGES. HAZARDOUS VOLTAGES ARE PRESENT ON THE POWER SUPPLY CIRCUIT BOARD FOR APPROXIMATELY 5 MINUTES AFTER POWER IS DISCONNECTED. DO NOT TROUBLE-SHOOT WITH THE SIDE-PANEL REMOVED.

WARNING

Low voltages are used throughout the exciter circuitry with the exception of the power supply circuit board, the rear-mounted AC on/off switch, and the front-panel switch circuit board. The power supply circuit board and the front-panel switch circuit board contain hazardous voltages and must not be accessed when power is energized. Hazardous voltages on the power supply circuit board are present for approximately 5 minutes after ac power is disconnected. Never remove the side-panel and apply ac power. Maintenance with power energized is always considered hazardous and caution should be observed.



WARNING

ENSURE ALL PRIMARY POWER IS DISCONNECT FROM THE EXCITER BEFORE ATTEMPTING EQUIPMENT MAINTENANCE.

WARNING

5.2 FIRST LEVEL MAINTENANCE.

First level maintenance consists of precautionary procedures applied to equipment to prevent future failures. These procedures are performed on a regular basis and the results recorded in a performance log.

5.2.1 ROUTINE MAINTENANCE.

INSPECTION AND CLEANING. On a regular basis, clean the exciter of accumulated dust using a brush and vacuum cleaner. Inspect the circuit boards for damage caused by component overheating. Overheated components are identified by circuit board discoloration near the component leads. Also, inspect the circuit boards for loose hardware as required.

AIR FILTER. The exciter is equipped with a rear-mounted screen-type air filter. The filter is removable and may be cleaned with a brush and vacuum. A dirty filter results in restricted air flow and increased operating temperatures for the solid-state components. Check the filter approximately once a week.

5.3 SECOND LEVEL MAINTENANCE.

Second level maintenance consists of procedures required to restore the exciter to operation after a fault has occurred. The maintenance philosophy of the exciter consists of problem isolation to a specific circuit board. Due to the surface mount technology used to construct the circuit boards, the circuit boards cannot be repaired in the field without specialized soldering equipment. When a defective circuit board is located, the circuit board can be returned to Broadcast Electronics for repair.

5.4 ADJUSTMENTS.

5.4.1 CONTROLLER CIRCUIT BOARD.

FORWARD POWER CALIBRATION. The forward power circuit on the controller circuit board is calibrated by adjusting forward power calibration control R40 (refer to Figure 5-1). This control is to be adjusted only when the exciter PA module is replaced. To calibrate the forward power circuitry, proceed as follows:

Required Equipment. The following tools and equipment are required for the adjustment procedures.

- A. Insulated adjustment tool.
- B. FXi-60: Non-inductive, 100 watt, 50 Ohm test load. FXi – 250: Non-inductive, 300 watt, 50 Ohm test load.
- C. Coaxial Type-N Accessory Cable.
- D. Calibrated 50 Ohm in-line wattmeter.

Procedure. To adjust forward power calibration control R40, proceed as follows:



WARNING

DISCONNECT THE EXCITER PRIMARY POWER BEFORE PROCEEDING.

WARNING

1. Disconnect the exciter primary power.
2. For FXi-60 models; connect a 100 watt, 50 Ohm test load and in-line calibrated wattmeter to the rear-panel RF output receptacle. For FXi-250 models; connect a 300 watt, 50 Ohm test load and in-line wattmeter to the rear-panel RF output receptacle.
3. Remove the top-cover.
4. Apply primary power and operate the exciter.



WARNING

DO NOT TOUCH ANY COMPONENT WITHIN THE EXCITER WITH POWER APPLIED.

WARNING

5. Refer to Figure 5-1 and adjust forward power calibration control R40 to adjust the output power on the wattmeter to equal the value displayed on the Main Menu FWD PWR display (Figure 5-2).



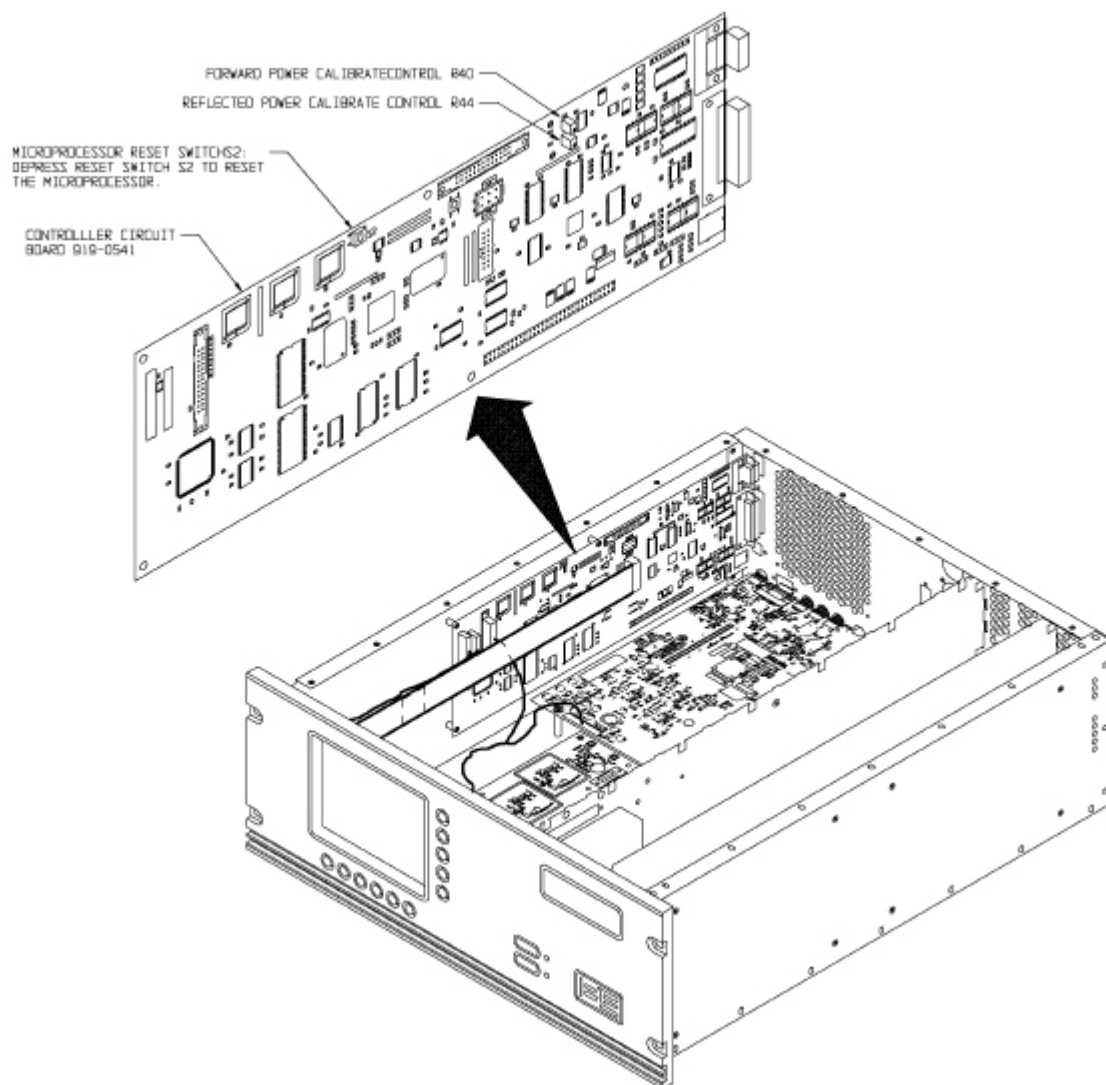


Figure 5-1. CONTROL CIRCUIT BOARD CONTROLS



WARNING

DISCONNECT THE EXCITER PRIMARY POWER BEFORE PROCEEDING.

WARNING

6. Disconnect the exciter primary power.
7. Remove the test equipment and return the exciter to service.

5.5 FAULT DISPLAYS.

The FXi is equipped with a fault display on the Main Menu (refer to Table 5-1 and Figure 5-2). The display presents general and specific fault conditions such as a temperature fault. In addition, fault information and status information for many FXi operating parameters is presented in the Diagnostics Menu (refer to Table 5-2 and Figure 5-3). The Diagnostics Menu presents the status of several operating parameters such as the 10 MHz reference, power amplifier module voltages and currents, and power supply voltages. A fault analysis display presents a description of the possible fault condition.

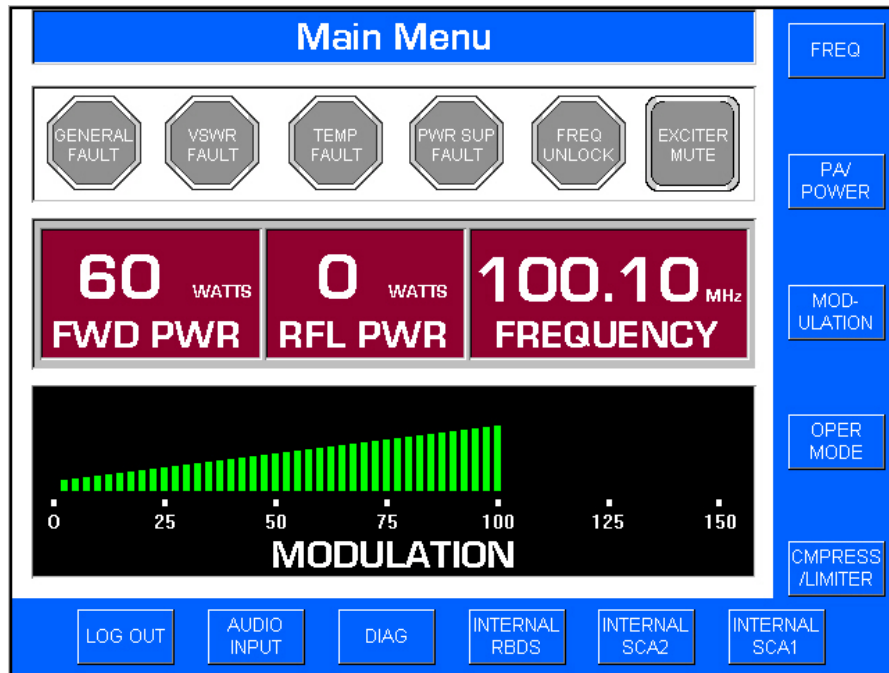


Figure 5-2. MAIN MENU

Table 5-1. MAIN MENU CONTROLS AND INDICTORS

NOMENCLATURE	DESCRIPTION
GENERAL FAULT	Illuminates to indicate a VSWR FAULT, TEMP FAULT, PWR SUPPLY FAULT, or FREQ UNLOCK fault condition. In addition, the indicator will illuminate to indicate any of the following fault conditions: 1) PA RF input high/low, 2) RF output low, 3) loss of AES/EBU, 4) loss of the 44.1 kHz clock, (IBOC circuit board only) 5) final 1, final 2, IPA, or driver current out-of-tolerance, 6) +16V, +12.5V, +5V, +3.3V, +1.8V, +1.5V, +7.5V out-of-tolerance, 7) DSP communication fault, 8) loss of composite, and 9) A/D and sample rate converter clock errors.
VSWR FAULT	Illuminates to indicate a PA VSWR foldback or shutdown condition. The foldback threshold is 1.5:1. The shutdown threshold is 2.0:1.
TEMP FAULT	Illuminates to indicate a PA heatsink temperature foldback or shutdown condition. The foldback threshold is 85° C for the FXi-60 and 105° C for the FXi-250. The shutdown threshold is 55° C above the foldback threshold.
PWR SUP FAULT	Illuminates to indicate one of the following conditions on the power supply circuit board: 1) +16V out-of-tolerance, 2) +7.5V out-of-tolerance, 3) +24V out-of-tolerance, 4) PAV (+48V) out-of-tolerance, 5) the heatsink temp is above the threshold, 6) the bulk supply is below 350 volts.
FREQ UNLOCK	Illuminates to indicate a VCO failure on the oscillator/filter circuit board or a 10 MHz reference fault.
MUTE	Displays a yellow square to indicate the exciter is muted from an external source such as the transmitter or the absence of a mute signal connected to J3-14. Displays a red octagon to indicate the exciter controller has muted the output due to one of the following fault conditions: 1) an automatic frequency control unlock, 2) general power supply fault, 3) VSWR shutdown, 4) temperature shutdown, or 5) RF drive low.

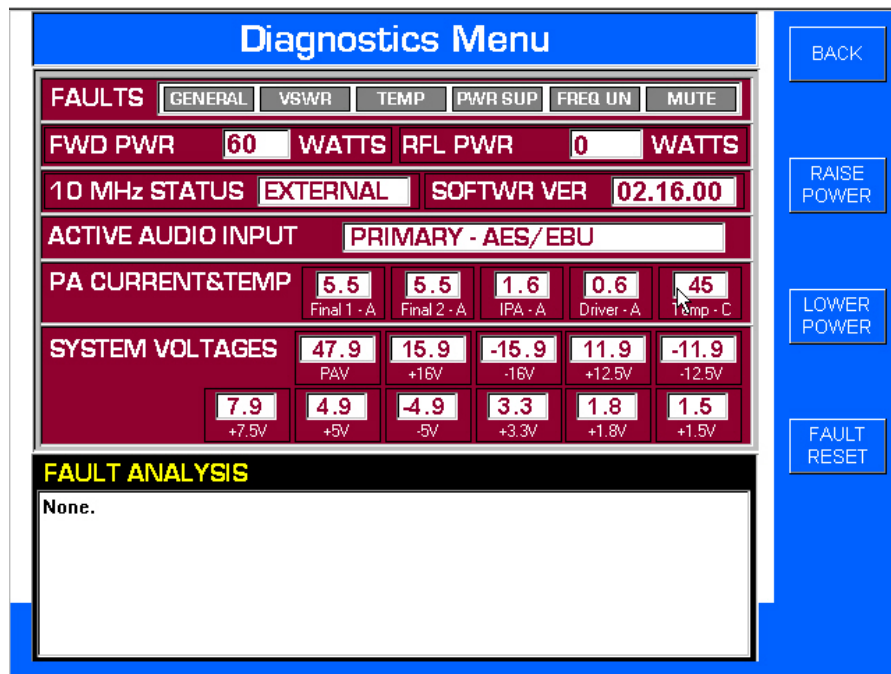


Figure 5-3. DIAGNOSTICS MENU

Table 5-2. DIAGNOSTICS MENU CONTROLS AND INDICATORS

NOMENCLATURE	DESCRIPTION
GENERAL FAULT	Illuminates to indicate a VSWR FAULT, TEMP FAULT, PWR SUPPLY FAULT, or FREQ UNLOCK fault condition. In addition, the indicator will illuminate to indicate any of the following fault conditions: 1) PA RF input high/low, 2) RF output low, 3) loss of AES/EBU, 4) loss of the 44.1 kHz clock, (IBOC circuit board only) 5) final 1, final 2, IPA, or driver current out-of-tolerance, 6) $\pm 16V$, $\pm 12.5V$, $\pm 5V$, $+3.3V$, $+1.8V$, $+1.5V$, $+7.5V$ out-of-tolerance, 7) DSP communication fault, 8) loss of composite, and 9) A/D and sample rate converter clock errors.
VSWR FAULT	Illuminates to indicate a PA VSWR foldback or shutdown condition. The foldback threshold is 1.5:1. The shutdown threshold is 2.0:1.
TEMP FAULT	Illuminates to indicate a PA heatsink temperature foldback or shutdown condition. The foldback threshold is 85° C for the FXi-60 and 105° C for the FXi-250. The shutdown threshold is 5° C above the foldback threshold.
PWR SUP FAULT	Illuminates to indicate one of the following conditions on the power supply circuit board: 1) $\pm 16V$ out-of-tolerance, 2) $+7.5V$ out-of-tolerance, 3) $+24V$ out-of-tolerance, 4) PAV ($+48V$) out-of-tolerance, 5) the heatsink temp is above the threshold, 6) the bulk supply is below 350 volts.

FREQ UNLOCK	Illuminates to indicate a VCO failure on the oscillator/filter circuit board or a 10 MHz reference fault.
MUTE	Displays a yellow square to indicate the exciter is muted from an external source such as the transmitter or the absence of a mute signal connected to J3-14. Displays a red octagon to indicate the exciter controller has muted the output due to one of the following fault conditions: 1) an automatic frequency control unlock, 2) general power supply fault, 3) VSWR shutdown, 4) temperature shutdown, or 5) RF drive low.
FWD PWR	Forward power display. Displays the exciter forward power output in watts.
RFL PWR	Reflected power display. Displays the exciter reflected power in watts. The display will illuminate red when the FXi is in a VSWR foldback or VSWR shutdown condition. Foldback is a response to a VSWR condition between 1.5:1 and 1.9:1. Shutdown is a response to a VSWR condition greater than 2.0:1.
10 MHz STATUS	Displays the status of the 10 MHz reference. The display will present either INTERNAL or EXTERNAL. The display will illuminate red when the FXi detects a fault in the selected reference and will automatically switch the other reference if present.
SOFTWR VER	Software version display.
ACTIVE AUDIO INPUT	Audio input status display. The display will present the active on-air audio input. The options are AES/EBU, composite, or analog left/right. The display will illuminate and remain red when the exciter switches to the backup audio input if selected.
PA CURRENTS & TEMP	Presents the status of the power amplifier module: 1) final 1 current, 2) final 2 current, 3) IPA current, 4) driver current, and 5) temperature. Each individual display will illuminate and remain red when the parameter is out-of-tolerance.
SYSTEM VOLTAGES	Presents the status of the system power supply voltages. The voltages include: 1) PAV, 2) +16 volts, 3) -16 volts, 4) +12.5 volts, 5) -12.5 volts, 6) +7.5 volts, 7) +5 volts, 8) -5 volts, 9) +3.3 volts, 10) +1.8 volts, and 11) +1.5 volts. Each individual display will illuminate and remain red when the parameter is out-of-tolerance.
FAULT ANALYSIS	Presents a detailed description of the fault and the most likely trouble-shooting remedy.
RAISE POWER Button	Increases the FXi forward power when depressed using a Button two-speed control function. When depressed and released, the power will increase in small increments. When depressed and held, the power will increase rapidly.
LOWER POWER Button	Decrease the FXi forward power when depressed.
FAULT RESET Button	Resets each fault display when depressed.

5.6 FAULT OPERATION.

5.6.1 10 MHz REFERENCE.

Refer to Figure 5-4. The FXi is equipped with automatic switching for the 10 MHz reference. The primary 10 MHz reference can be either internal or external. If an external source is connected and a fault is detected, the unit will: 1) switch to the other source and 2) generate a fault condition. The fault condition cannot be reset until the selected reference is present. If external is inadvertently selected when no external input is connected, the unit will: 1) switch to external, 2) determine that no reference is present, 3) switch back to internal, and 4) generate a fault condition. The 10 MHz Status display on the Diagnostics Menu will illuminate red.

5.6.2 AUDIO INPUT.

The FXi monitors the primary audio input for fault conditions. The primary audio source options include: 1) AES/EBU, 2) COMPOSITE, and 3) analog LEFT/RIGHT. The backup audio sources include: 1) AES/EBU, 2) COMPOSITE, 3) analog LEFT/RIGHT, and 4) NONE. If analog left/right is selected as the primary source, NONE is automatically selected as the backup source. This is due to the absence of a presence signal in the source. Also see paragraph NO TAG

In the event of a fault in the primary source, the FXi will automatically switch to the backup source if selected. The Active Audio Input display in the Diagnostics Menu will illuminate red.

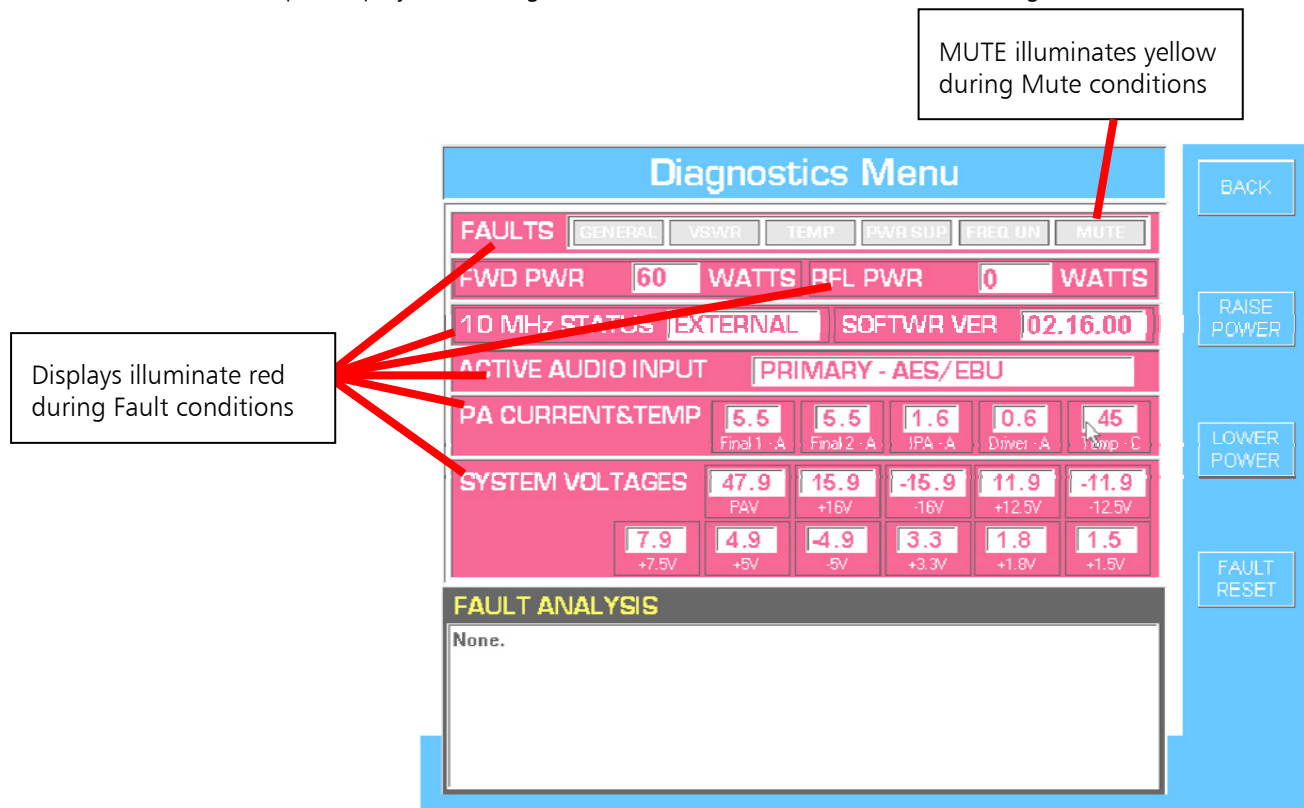


Figure 5-4. DIAGNOSTICS MENU - FAULTS

The FXi will only switch to the backup audio input source. Backup SCA or RBDS input configurations are not supported. For example, if the internal SCA/RBDS generators are enabled and the primary audio input source faults, the FXi will switch to the backup source and the SCA/RBDS generators will continue to operate. If Composite with SCA/ RBDS included in the composite signal is the primary source and a fault is encountered, the unit will automatically switch to the backup source. With the fault in the composite signal, SCA/RBDS operation will be disabled. The internal SCA/RBDS generators can be manually enabled if desired.

If AES/EBU is selected as the primary source and a fault is encountered, the FXi will switch to the backup source if selected. When the AES/EBU signal returns, the FXi will automatically switch back to the primary AES/EBU signal. Automatic switching back to the primary source is only possible with the AES/EBU signal.

5.6.3 POWER SUPPLY CIRCUIT BOARD.

The Diagnostics Menu presents detailed power supply fault messages. However, the power supply circuit board is equipped with LEDs for additional troubleshooting procedures. The LEDs can be observed from the rear or right side-panel (refer to Figure 5-5).

The +7.5V (+8V), +16V, -16V, +24V, and PAV (+48V) supplies are equipped with high and low LEDs. Each indicator will illuminate when a supply is out-of-tolerance. If any supply goes out-of-tolerance, the PAV (+48V) supply will be shut down and the +48V LOW indicator will illuminate. As a result, when any supply is out-of-tolerance, both the individual supply indicator and the +48V LOW indicator will illuminate. If the +48V supply is high, the +48V HIGH LED will illuminate briefly before the supply is shut down. As a result, if only the +48V LOW LED is illuminated, the +48V supply could contain a high or low fault condition.

If a power supply circuit board fault is encountered such as a +24V failure, high heat sink temperature, or low bulk supply, the unit will automatically shutdown. The exciter will wait 5 seconds and attempt operation. If another fault is not detected after 5 seconds, operation will continue and the fault counter will be reset after 60 seconds. If 3 faults with a maximum 60 second delay following each fault are detected, the unit will remain shutdown.

5.6.4 POWER AMPLIFIER.

VSWR. The power amplifier has two thresholds to respond to high VSWR conditions. When the VSWR condition reaches a specific threshold, the power amplifier will foldback. On-air operation will be maintained at a lower output power level. This operation will continue until the condition is removed. Once the condition is removed, the unit will automatically return to normal operation.

If the VSWR condition reaches a higher threshold, the unit will automatically shutdown. The unit will wait 5 seconds and attempt operation. Two additional re-start attempts will occur at 5 second intervals (approximately). If the fault remains, the unit will remain shutdown. If 60 seconds of continuous operation is detected following the re-start, the fault counter will reset.

TEMPERATURE. The power amplifier has two thresholds to respond to high temperature conditions. When the temperature condition reaches a specific threshold, the power amplifier will foldback. On-air operation will be maintained at a lower output power level. This operation will continue until the condition is removed. Once the condition is removed, the unit will automatically return to normal operation.

If the temperature condition reaches a higher threshold, the unit will automatically shutdown. The unit will wait until the temperature is below the foldback threshold to return to operation.



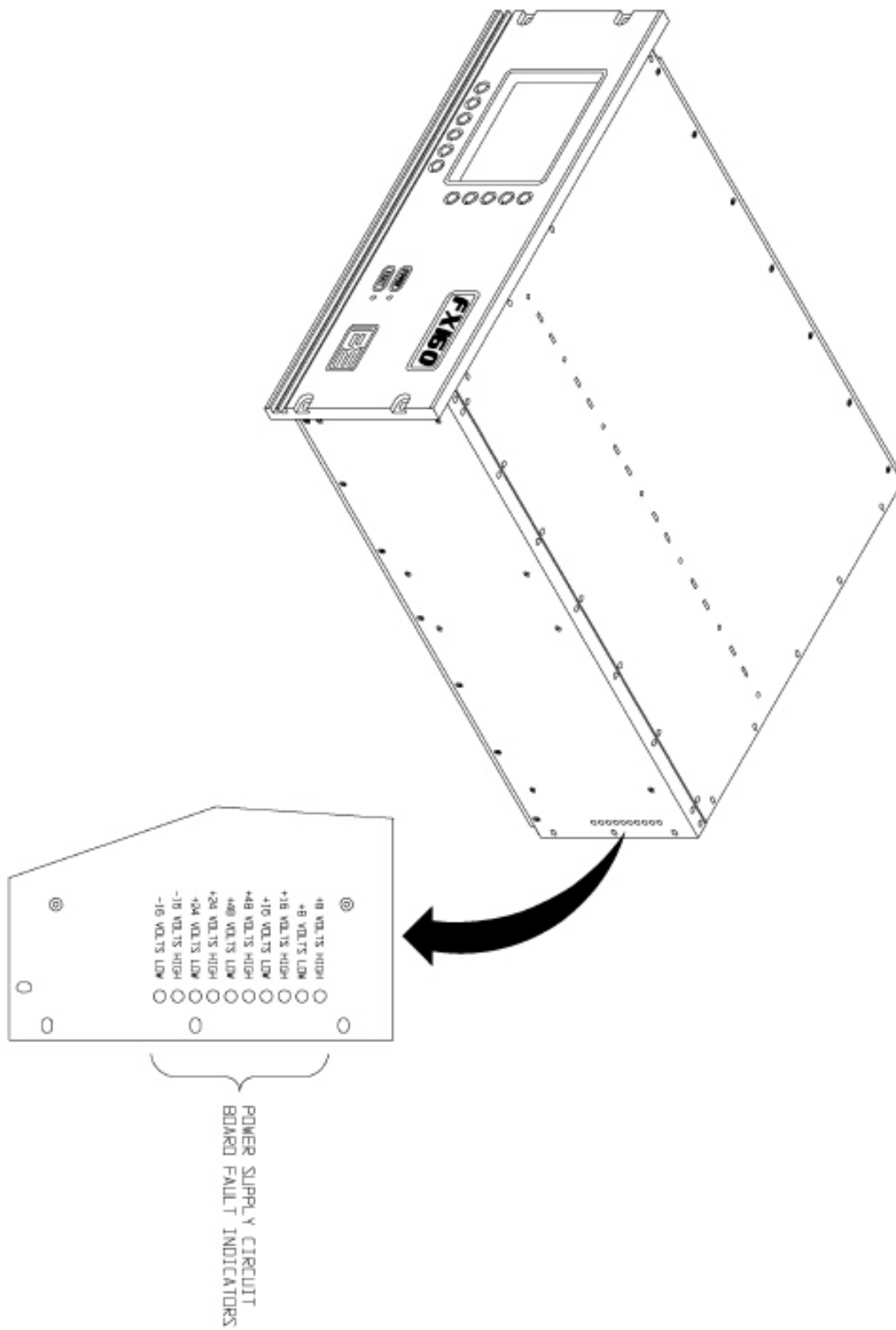


Figure 5-5. POWER SUPPLY FAULT LEDS

5.7 DISPLAY OF MULTIPLE FAULTS.

The FXi will monitor and display multiple faults. During multiple fault conditions: 1) the Main Menu and Diagnostics Menu will display all fault conditions and 2) the FAULT ANALYSIS window in the Diagnostics Menu will display the highest priority fault. For example, if the AES/EBU signal is not connected and a low RF input fault is detected, the following will occur: 1) the GENERAL and MUTE fault indicators on the Main and Diagnostics Menus will illuminate red for the AES/EBU and the low RF input faults, 2) the ACTIVE AUDIO INPUT display on the Diagnostics Menu will illuminate red for the AES/ EBU fault, and 3) the FAULT ANALYSIS window in the Diagnostics Menu will present the message for the low RF input fault. This is because the low RF input fault has the highest priority.

5.8 FAULT PRIORITY SYSTEM.

During multiple fault conditions, the fault priority system determines which fault has the highest priority and will be displayed on the FAULT ANALYSIS window in the Diagnostics menu. The following text presents the fault priority assignments.

Table 5-3. FAULT PRIORITY

OVERALL	
POWER INDICATOR	On
FAULT INDICATOR	Off
MAIN MENU	
Forward Power	
FXi-60	5W to 60W
FXi-250	25W to 250W
Reflected Power	
FXi-60	1W to 2W
FXi-250	25W to 250W
Fault Display	None
DIAGNOSTIC MENU	
Forward Power	
FXi-60	5W to 60W
FXi-250	25W to 250W
Reflected Power	
FXi-60	1W to 2W
FXi-250	2W to 6W

Fault Display	None
10 MHz Status	INTERNAL or EXTERNAL as selected – No red display
Active Audio Input	AES/EBU, COMPOSITE, or LEFT/RIGHT as selected for Primary Operation – No red display
PA Current/TEMP	No red displays.
FXi-60	
Final 1	0.5A to 1.5A
Final 2	0.5A to 1.7A
IPA	0.1A to 0.7A
Driver	0.06A to 0.12A
Temp	20° C to 30° C above ambient room temperature.
FXi-250	
Final 1	3.5A to 6.5A
Final 2	3.5A to 6.5A
IPA	0.1A to 0.6A
Driver	0.1A to 0.15A
Temp	20° C to 30° C above ambient room temperature.
System Voltages	No red displays
PAV	Power adjust voltage. Varies with output power. For FXi-60 – 30 volts to 40 volts for an output power from 30 W to 60 W. For FXi-250 – 35 volts to 45 volts for an output power from 125 W to 250 W.
+16V	+15V to +16.2V
-16V	-15V to -16.2V
+12.5V	+11.7V to +12.9V
-12.5V	-11.7V to -12.9V
+7.5V	+7V to +7.9V
+5V	+5V to +5.2V
-5V	-5V to -5.2V
+3.3V	+3.1V to +3.5V
+1.8V	+1.6V to +1.9V
+1.5V	+1.3V to +1.6V



5.9 REMOVING FAULT CONDITIONS.

Exciter fault operation consists of detecting and displaying fault conditions on the Main and Diagnostics Menus. To clear a fault: 1) remove the fault condition and 2) depress the FAULT RESET button on the Diagnostics Menu. Each fault display will reset to normal.



WARNING

DISCONNECT POWER PRIOR TO SERVICING.

WARNING

5.10 TROUBLESHOOTING.

The FXi troubleshooting philosophy consists of isolating a problem to a specific circuit board. Typical indications are presented in Table 5-3. Figure 5-6 presents the FXi component locations. Table 5-5 presents the FXi troubleshooting information. Use the information, the diagnostics menu, and the indicators to isolate the problem to a specific circuit board. Table 5-5 presents the factory default jumper programming for all the FXi circuit boards.

5.10.1 CONTROLLER CIRCUIT BOARD MICROPROCESSOR RESET.

The controller circuit board is equipped with microprocessor reset switch S2 (refer to Figure 5-1). If the microprocessor on the controller circuit board needs to be reset, depress switch S2.

5.10.2 READING SEVERAL OPERATING PARAMETERS AT ONCE.

It is possible to read several operating parameters at once. This requires establishing communication with rear-mounted SERIAL PORT J10. Refer to Operations section for details on setting up communication. Once communication is established, an FXi-generated message appears on the terminal screen. Refer to Figure 3-45. Press **e** to retrieve engineering statistics. Text similar to the following command-line message appears on the terminal:

```
BE Engineering statistics
lFwdPwrSet= 422          reading[0]= 422          pscontrol=3368
vfold= 0                tfold= 0                ifold= 0
muted= 0                iModulation= 100          iLeftLevel=10
lFault= 0               lFaultContinue= 0         scale=10
fRflPwr= 0.97
```

This information may be printed or saved to a file.

Press **m** to retrieve metering statistics. Text similar to the following command-line message appears on the terminal:

```
BFXi exciter, (c)2003 Broadcast Electronics Inc.
Metering
Forward: 238              Reflected: 0
Final1 current: 5.3       Final2 current: 5.3
IPA current: 1.0          Driver current: 0.1
PAV: 40.7                 +7.5V: 7.4
+16V: 16.0                +12.5V: 12.3
-16V: -16.2               -12.5V: -12.4
+3.3V: 3.3                +5V: 5.0
+1.8V: 1.8                -5V: -5.0
+1.5V: 1.5                Temp: 49

Status
Frequency: 98.10          Transmitter type: S
10 MHz ref: internal      Software version: 02.15.00
Deviation: 75             Pre-emphasis: 2
```



Stereo mode	Pilot level: 10.0
SCA 1	
Frequency: 67	Deviation: 5.0
Level: off	Pre-emphasis: 150
SCA 2	
Frequency: 92	Deviation: 5.0
Level: off	Pre-emphasis: 150
RBDS Level: off	External SCA Level: off
Compressor/Limiter	
Compressor level: off	Compressor attack: 1
Limiter level: off	Compressor release: 100
Inputs selections	
Primary: AES/EBU	Back up: Composite
Active: AES/EBU	IBOC mode: FM only
N Plus 1 frequencies:	
1: 97.10	5: 97.90
2: 97.30	6: 98.10
3: 97.50	7: 98.30
4: 97.70	8: 98.50

This information may be printed or saved to a file.

5.11 SOFTWARE UPGRADE

Refer to the appropriate Application Guide to update the software in the FXi. See FXi Exciter Software Upgrade Application Guide, 597-0541-005 for assistance in grading the software.

5.12 COMPONENT REPLACEMENT ON CIRCUIT BOARDS

The circuit boards used in the FXi digital exciter are constructed using surface-mount technology. Therefore, components on the circuit boards cannot be replaced without destruction of the circuit board traces unless special surface-mount soldering equipment is used.



WARNING

WARNING

DISCONNECT THE PRIMARY POWER TO THE EXCITER BEFORE PROCEEDING. HAZARDOUS VOLTAGES ARE PRESENT ON THE POWER SUPPLY CIRCUIT BOARD FOR APPROXIMATELY 5 MINUTES AFTER POWER IS DISCONNECTED.



Table 5-4. TYPICAL INDICATIONS

OVERALL	
POWER INDICATOR	On
FAULT INDICATOR	Off
MAIN MENU	
Forward Power	
FXi-60	5W to 60W
FXi-250	25W to 250W
Reflected Power	
FXi-60	1W to 2W
FXi-250	25W to 250W
Fault Display	None
DIAGNOSTIC MENU	
Forward Power	
FXi-60	5W to 60W
FXi-250	25W to 250W
Reflected Power	
FXi-60	1W to 2W
FXi-250	2W to 6W
Fault Display	None
10 MHz Status	INTERNAL or EXTERNAL as selected – No red display
Active Audio Input	AES/EBU, COMPOSITE, or LEFT/RIGHT as selected for Primary Operation – No red display
PA Current & TEMP	No red displays.
FXi-60	
Final 1	0.5A to 1.5A
Final 2	0.5A to 1.7A
IPA	0.1A to 0.7A
Driver	0.06A to 0.12A



Temp	20° C to 30° C above ambient room temperature.
FXi-250	
Final 1	3.5A to 6.5A
Final 2	3.5A to 6.5A
IPA	0.1A to 0.6A
Driver	0.1A to 0.15A
Temp	20° C to 30° C above ambient room temperature.
System Voltages	No red displays
PAV	Power adjust voltage. Varies with output power. For FXi-60 – 30 volts to 40 volts for an output power from 30 W to 60 W. For FXi-250 – 35 volts to 45 volts for an output power from 125 W to 250 W.
+16V	+15V to +16.2V
-16V	-15V to -16.2V
+12.5V	+11.7V to +12.9V
-12.5V	-11.7V to -12.9V
+7.5V	+7V to +7.9V
+5V	+5V to +5.2V
-5V	-5V to -5.2V
+3.3V	+3.1V to +3.5V
+1.8V	+1.6V to +1.9V
+1.5V	+1.3V to +1.6V



Table 5-5. FXi TROUBLESHOOTING

SYMPTOM	CIRCUITRY TO CHECK
1. FRONT-PANEL POWER INDICATOR NOT ILLUMINATED.	<ol style="list-style-type: none"> 1. Ensure the AC power switch is operated to ON. 2. On/Off switch/circuit breaker may have tripped. Reset by operating the On/Off switch to Off then On. 3. Check fuse F3 on the power supply circuit board. Check fuse F10 on the power supply circuit board. Check fuse F9 on the power supply circuit board. 4. Check fuse F10 on the power supply circuit board. 5. Check fuse F9 on the power supply circuit board.
1. MUTE – YELLOW/SQUARE	<ol style="list-style-type: none"> 1. Ensure the mute control signal is connected to J3-14 and ensure jumper P17 on the controller circuit board is installed in the appropriate position for the type of control signal used. For example, if HIGH control signal is used, P17 must be in position 2-3 (ground). 2. If the mute signal is controlled by external equipment, such as a transmitter, check the transmitter mute control output signal.
<ol style="list-style-type: none"> 1. FREQ UNLOCK, GENERAL, AND MUTE FAULT RED. 2. FAULT ANALYSIS – The main channel frequency is unlocked 	<ol style="list-style-type: none"> 1. Check the VCO circuit on the oscillator/filter circuit board.
<ol style="list-style-type: none"> 1. FREQ UNLOCK, GENERAL AND MUTE FAULT RED. ACTIVE 10 MHz STATUS RED. 2. FAULT ANALYSIS – The primary 10 MHz reference has failed. 	<ol style="list-style-type: none"> 1. Check the primary 10 MHz reference (either internal or external).
<ol style="list-style-type: none"> 1. TEMP, GENERAL, AND MUTE FAULT INDICATORS RED. PA TEMP RED. 2. FAULT ANALYSIS – The power amplifier is in temperature shutdown. 	<p>The unit will be in shutdown until the temperature falls below the threshold.</p> <ol style="list-style-type: none"> 1. Check the FXi air filter. 2. Check the fan.
<ol style="list-style-type: none"> 1. VSWR AND GENERAL INDICATORS RED. 2. FAULT ANALYSIS – The power amplifier is in VSWR foldback. 	<p>The unit will be in foldback until the VSWR falls below the threshold.</p> <ol style="list-style-type: none"> 1. Check the power amplifier module. 2. Check the load connected to the exciter.

1. VSWR AND GENERAL INDICATORS RED 2. FAULT ANALYSIS – The power amplifier is shut down due to high VSWR.	<p>The power amplifier has shut down due to high VSWR. The unit will wait 5 seconds and attempt operation. Two additional restart attempts will occur at 5 second intervals. If the fault remains, the unit will remain shut down. If 60 seconds of continuous operation is detected following the restart, the fault counter will reset.</p> <p>1. Check the power amplifier module. 2. Check the load connected to the exciter.</p>
1. GENERAL FAULT INDICATOR RED 2. FAULT ANALYSIS – A fault has occurred on the oscillator/filter circuit board.	1. Check the oscillator/filter circuit board and connecting cable.
1. GENERAL FAULT and mute INDICATORS RED. 2. FAULT ANALYSIS – The output power is low.	1. Check the power amplifier module.
1. GENERAL FAULT INDICATOR RED. PA FINAL 1 – RED 2. FAULT ANALYSIS – The final 1 current is high.	1. Check the final 1 stage transistor on the power amplifier module.
1. GENERAL FAULT INDICATOR RED. PA FINAL 2 – RED. 2. FAULT ANALYSIS – The final 2 current is high.	1. Check the final 2 stage transistor on the power amplifier module.
1. GENERAL FAULT INDICATOR RED. IPA – A RED. 2. FAULT ANALYSIS – The IPA current is high	1. Check the IPA stage transistor on the power amplifier module.
1. GENERAL FAULT INDICATOR RED. DRIVER – A RED. 2. FAULT ANALYSIS – The Driver current is high.	1. Check the driver stage transistor on the power amplifier module.
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – The RF input signal is low.	<p>1. Check the RF output level from the oscillator/filter circuit board. 2. Check the RF output level from the DSP circuit board.</p>
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – The IBOC AES/EBU 44.1 kHz clock signal is out of lock.	<p>1. Ensure the 10 MHz cable is connected between J510 on the DSP circuit board and J1 on the IBOC circuit board. 2. Check the clock signal on the IBOC circuit board.</p>
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – A DSP communication fault has occurred.	1. Check the DSP and controller circuit boards.
1. GENERAL FAULT INDICATOR RED. ACTIVE AUDIO INPUT RED. 2. FAULT ANALYSIS – The composite input signal is missing and the exciter has switched to the backup audio source if selected.	<p>1. Check the composite input signal to the exciter connecting cable. 2. Check the DSP circuit board.</p>
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – A sample rate and A/D converter clock error has occurred.	1. Check the DSP circuit board.
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – An IBOC/AES/EBU error has occurred.	1. Check the AES/EBU signal at the STUDIO AES IN input on the FXi.
1. GENERAL FAULT INDICATOR RED. 2. FAULT ANALYSIS – An FSI fault has occurred.	1. Check the FSI IBOC signal generator.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +1.5V power supply fault has occurred.	1. Check the +1.5V circuitry on the DSP circuit board.



1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +1.8V RED. 2. FAULT ANALYSIS – A +1.8V power supply fault has occurred.	1. Check the +1.8V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +3.3V RED. 2. FAULT ANALYSIS – A +3.3V power supply fault has occurred.	1. Check the +3.3V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +5V RED. 2. FAULT ANALYSIS – A +5V power supply fault has occurred.	1. Check the +5V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES -5V RED. 2. FAULT ANALYSIS – A -5V power supply fault has occurred.	1. Check the -5V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +7.5V RED. 2. FAULT ANALYSIS – A +7.5V power supply fault has occurred.	1. Check the +7.5V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +12.5V RED. 2. FAULT ANALYSIS – A +12.5V power supply fault has occurred.	1. Check the +12.5V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES -12.5V RED. 2. FAULT ANALYSIS – A -12.5V power supply fault has occurred.	1. Check the -12.5V circuitry on the DSP circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES +16V RED. 2. FAULT ANALYSIS – A +16V power supply fault has occurred.	1. Check the +16V circuitry on the power supply circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES -16V RED. 2. FAULT ANALYSIS – A -16V power supply fault has occurred.	1. Check the -16V circuitry on the power supply circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. SYSTEM VOLTAGES PAV RED. 2. FAULT ANALYSIS – The PAV (+48V) power supply control voltage is out of tolerance.	1. Check the PAV (+48V) circuitry on the power supply circuit board.
1. GENERAL AND POWER SUP FAULT INDICATORS RED. 2. FAULT ANALYSIS – The power supply has shut down due to a fault.	1. The unit will wait 5 seconds and attempt operation. Two additional restart attempts will occur at 5 second intervals. If the fault remains, the unit will remain shutdown. If 60 seconds of continuous operation is detected following the re-start, the fault counter will reset. The possible failures on the power supply circuit board include: 1) the +24V supply, 2) high heatsink temperature, or 3) the bulk supply is below 350 volts. Depress FAULT RESET to clear the fault display.

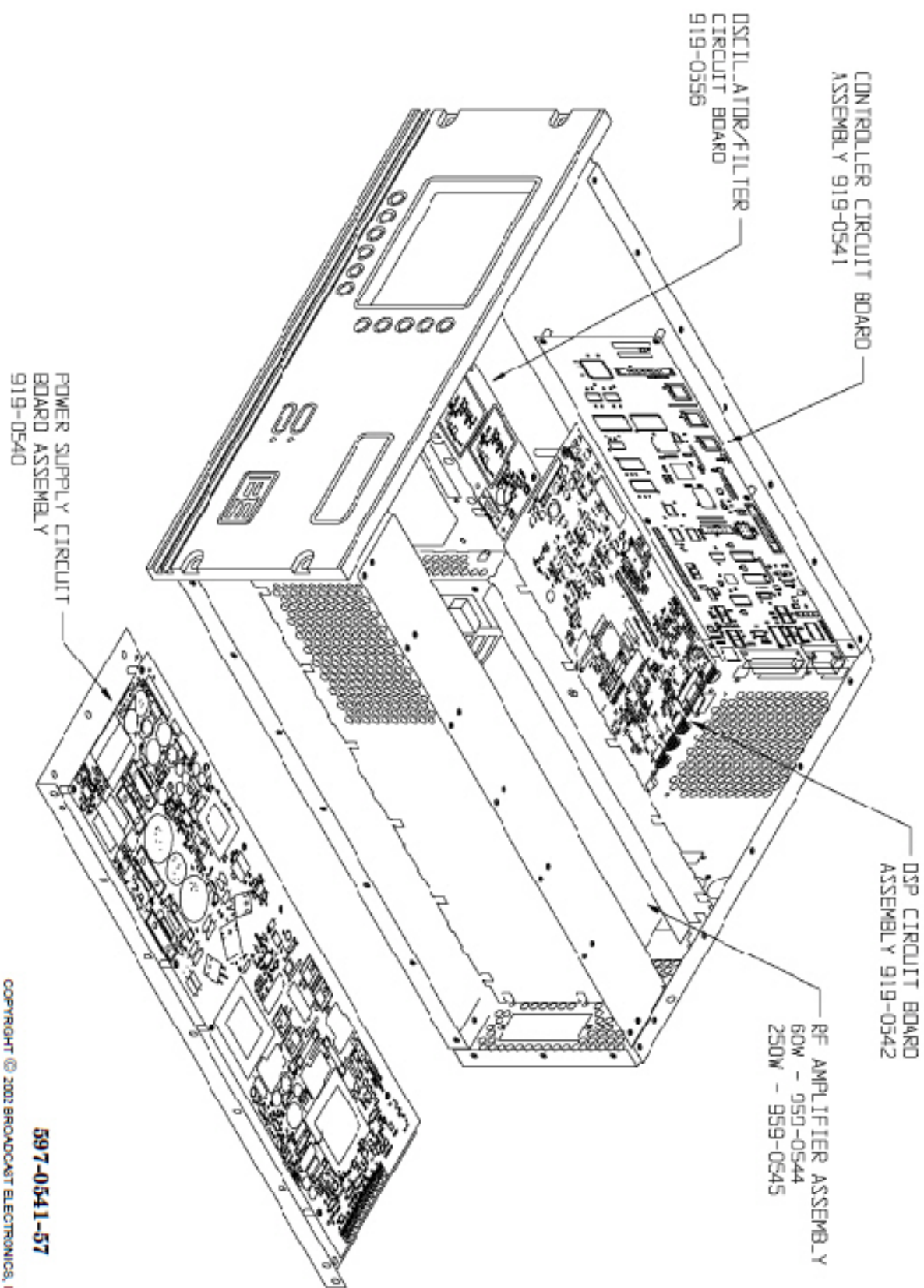
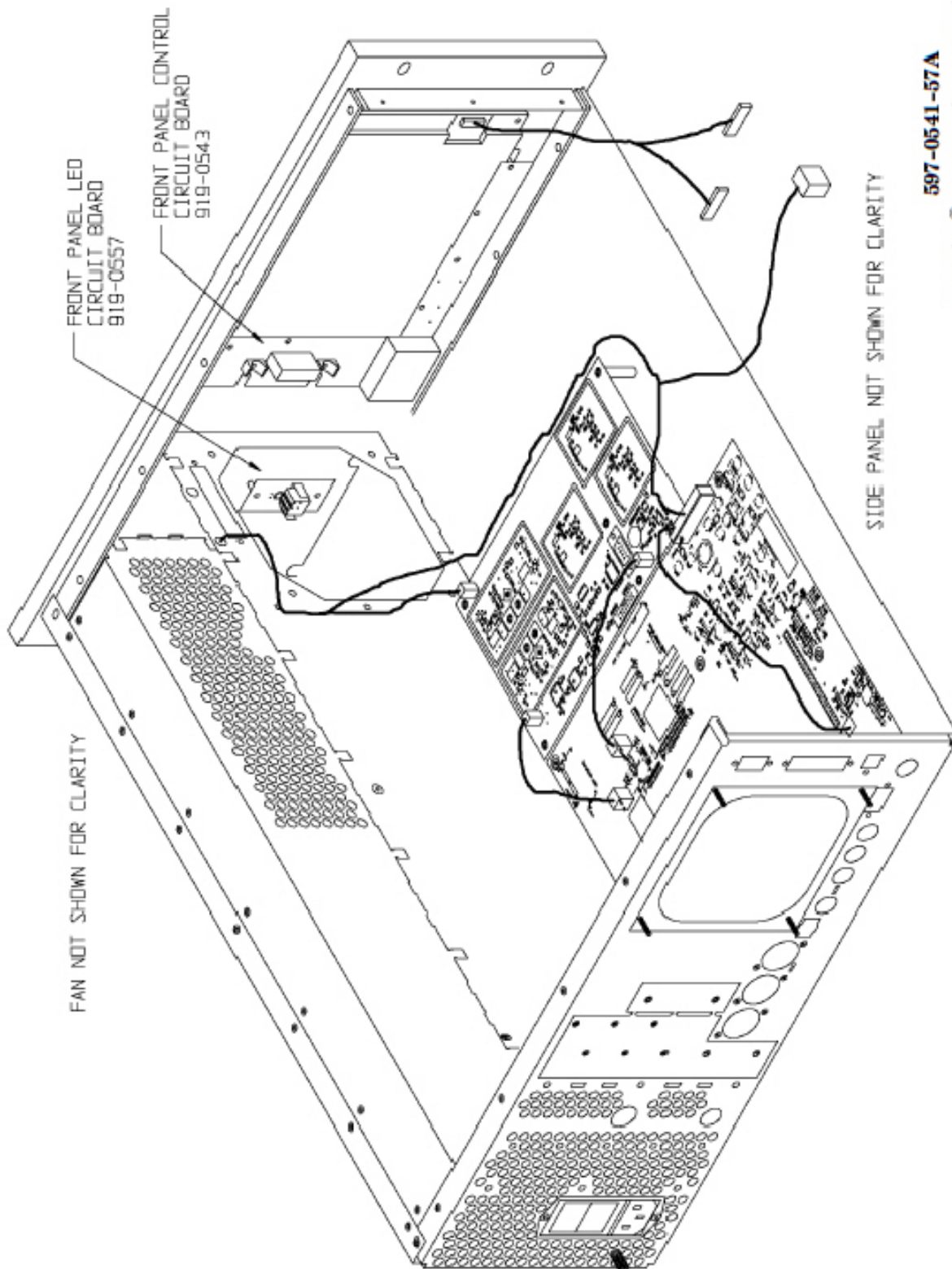


Figure 5-6. FXi COMPONENT LOCATION
(SHEET 1 OF 3)



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Figure 5-6. FXi COMPONENT LOCATION
(SHEET 2 OF 3)

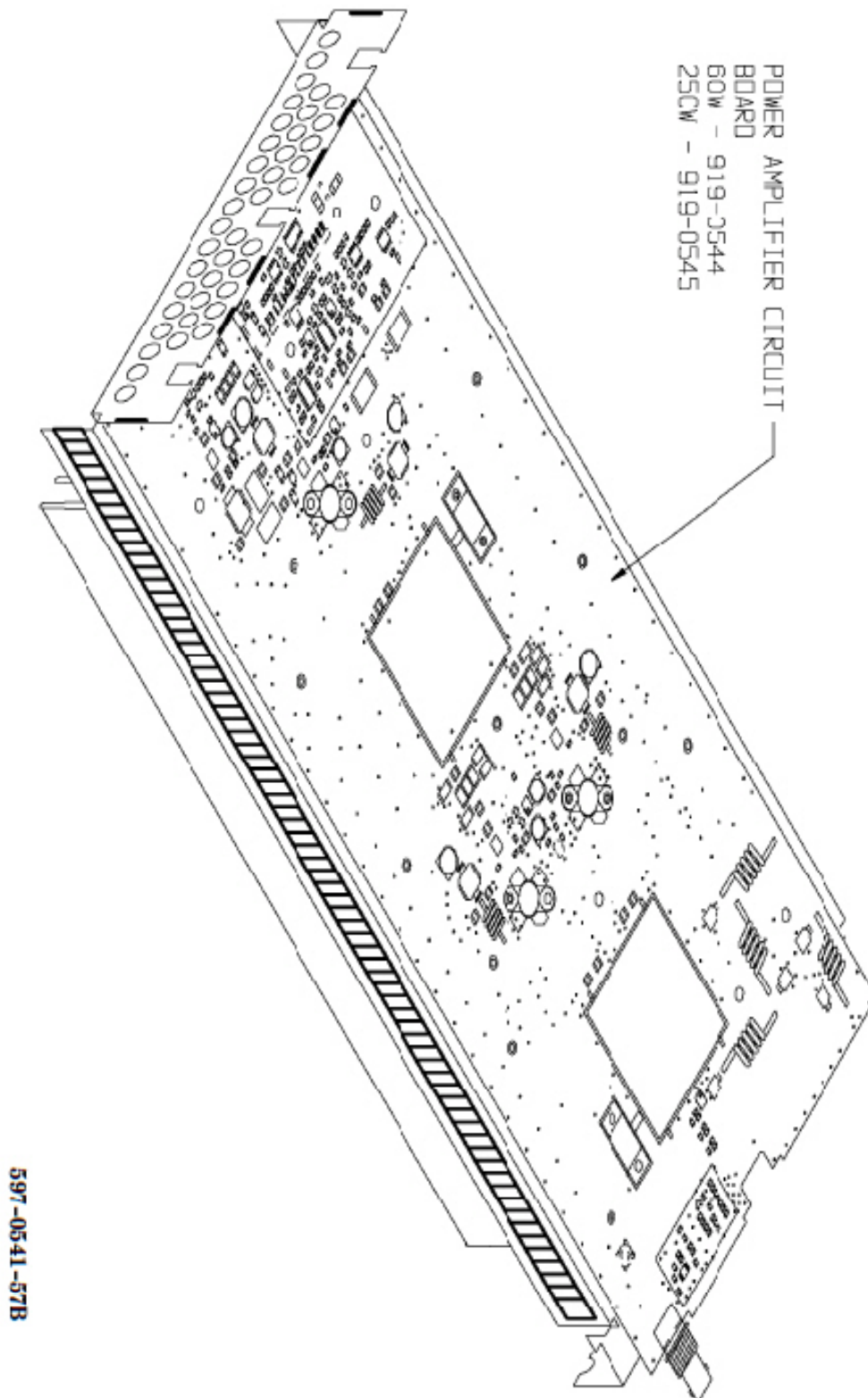


Figure 5-6. FXi COMPONENT LOCATION
(SHEET 3 OF 3)

Table 5-6. JUMPER POSITIONS – FACTORY DEFAULT

OPERATING PARAMETER FEATURE	COMPONENT LOCATION	FACTORY DEFAULT	JUMPER POSITION
PS Enable	J6- Power Supply	----	In Position 1-2
Test	J7- Power Supply	----	In Position 1-2
SDRAM Reset	J14- Controller	----	In Position 1-2
CPU Test Mode	J15- Controller	----	In Position 1-2
Debug Mode	J16- Controller	----	In Position 1-2
CPU Clock	J20- Controller	----	In Position 1-2
USB Mode	J8- Controller	----	In Position 1-2
Remote Common	J17- Controller	Ground	In Position 2-3
DSP1 Memory Programming	JP19- DSP	----	Install
DSP2 Memory Programming	JP27- DSP	----	Install
D-To-A Interpolation	J4- DSP	----	In Position 2-3
Right Channel Impedance	J506- DSP	600 Ohms	In Position 1-2
Left Channel Impedance	J509- DSP	600 Ohms	In Position 1-2
Balanced Composite Impedance	J515- DSP	50 Ohms	In Position 1-2
Internal/External 10 MHz Reference	J530- DSP	Internal On	In Position 1-2
Internal/External 10 MHz Reference Relay	J529- DSP	Internal On	In Position 1-2
Oscillator Normal/Download	J6- Osc/Filter	Normal	In Position 2-3
Oscillator Reset	J7- Osc/Filter	Normal	In Position 2-3 Momentary 1-2 To Reset
Filter Test/Normal	J4- Osc/Filter	Normal	In Position 2-3
N+1 Indicator Active High/Low	J4- N+1	Low Active	Remove P4
N+1 Remote Common	J5- N+1	Negative Control	In Position 1-2



5.13 COMPONENT-REPLACEMENT PROCEDURE.

The major parts listed in the parts list are field replaceable. The following procedures discuss removal and reinstallation. Assemblies within the FXi may be removed and reinstalled with common hand tools.

5.13.1 POWER SUPPLY CIRCUIT BOARD REMOVAL AND REINSTALLATION.

Refer to Figure 5-7. The power supply is attached to right wall of the chassis (as viewed from the front). The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing Power Supply Panel

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Use a Phillips screwdriver to remove screws on top of power supply panel and remaining screws on side. Set power supply panel on flat surface next to main chassis when it is detached. Retain hardware for reinstallation.
3. Note location of connectors, then disconnect all power supply connectors.
4. (if required) To separate power supply circuit board from metal panel, remove 8 Phillips screws from circuit board. Retain hardware for reinstallation.
5. If power supply is to be returned, follow precautions for handling and packing circuit board.

Reinstalling Power Supply Panel

1. (if required) Place power supply circuit board on metal panel. Use 8 Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
2. Place power supply circuit board with metal panel next to right side of exciter chassis. Attach connectors from chassis into power supply circuit board.
3. Lift power supply into chassis so that mounting holes on top and on sides match with power supply mounting holes. Use Phillips screws to fasten power supply into FXi chassis. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
4. When all FXi maintenance has been performed, reattach top cover.



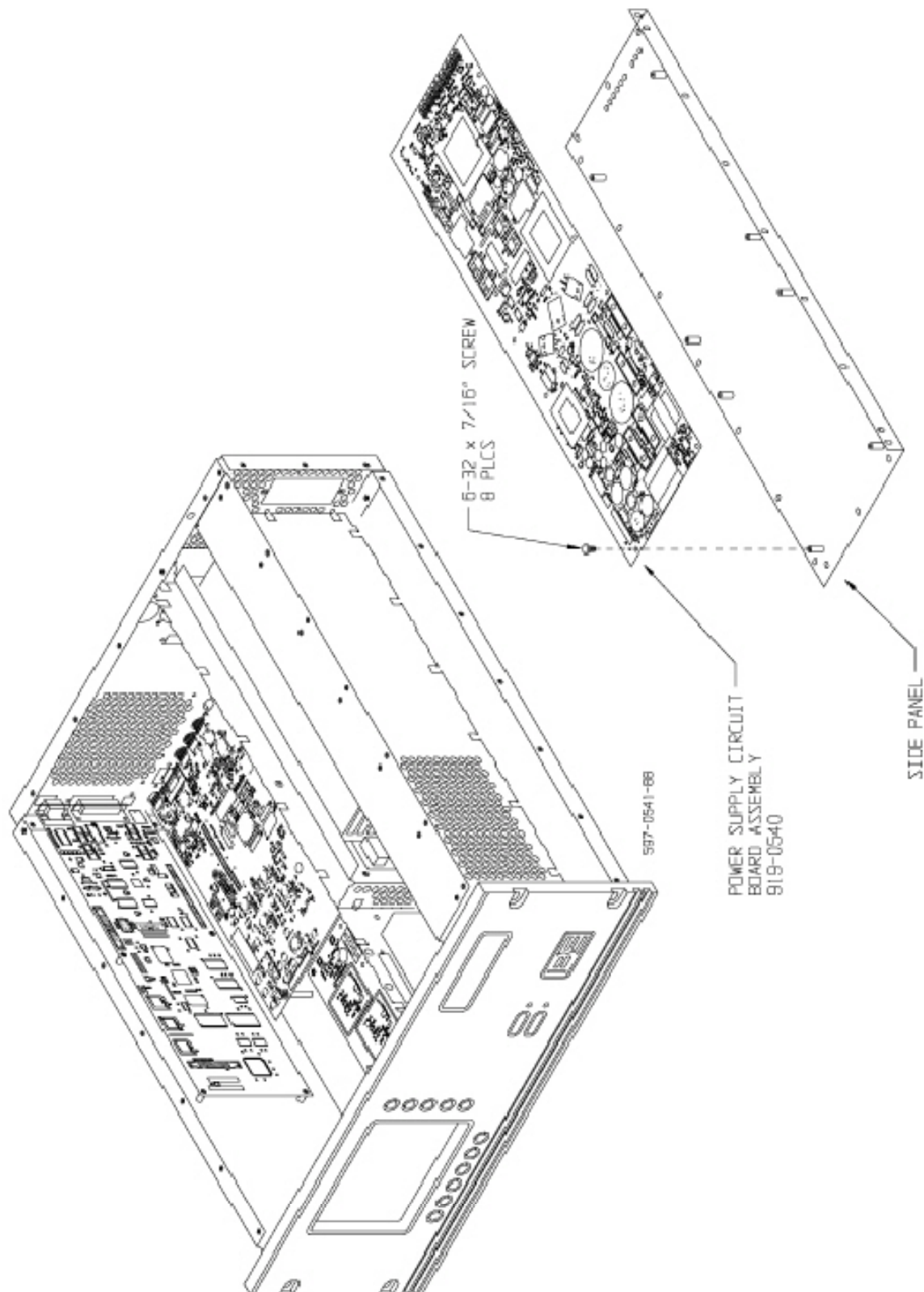


Figure 5-7. FXi POWER SUPPLY REMOVAL AND INSTALLATION
(SHEET 1 OF 2)

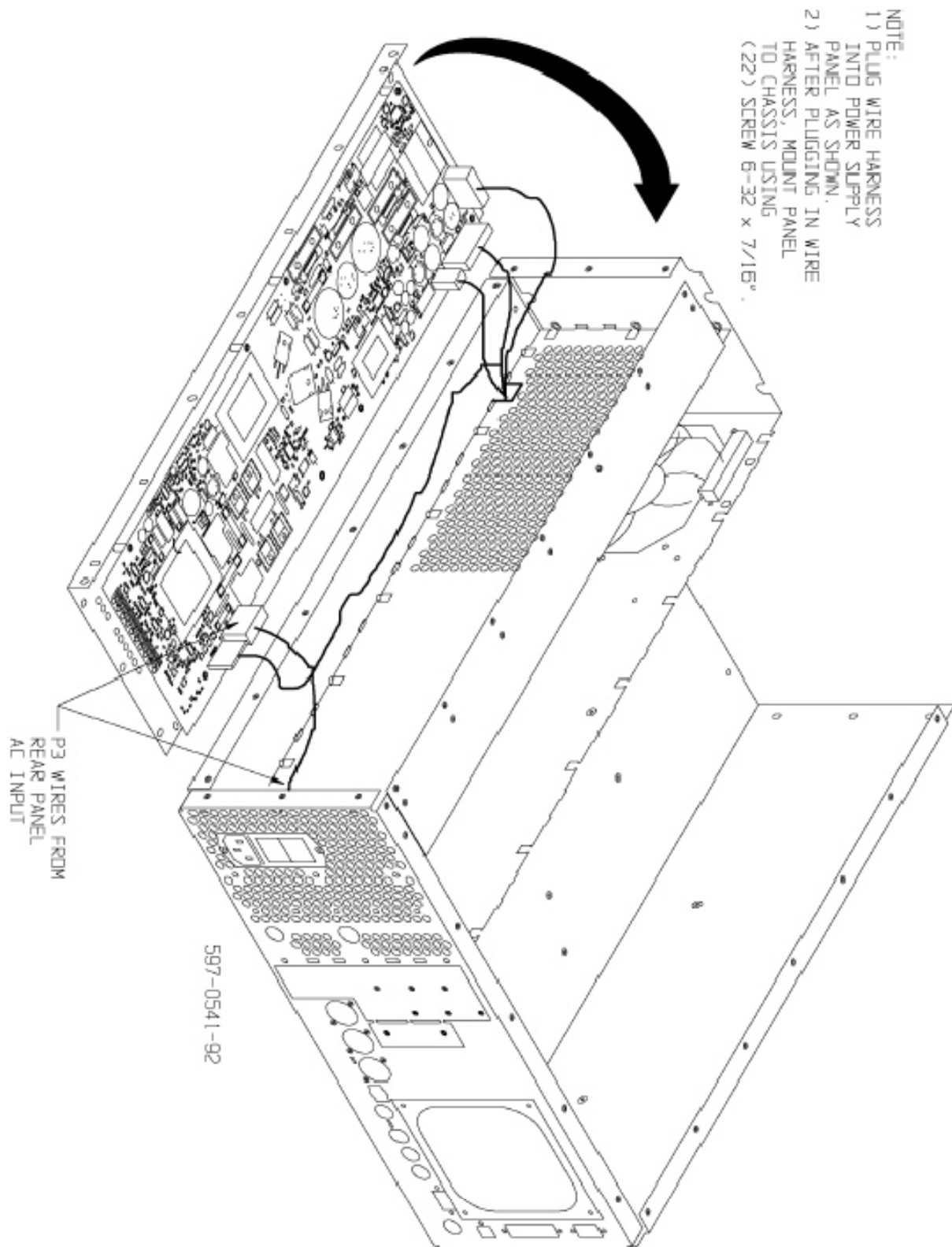


Figure 5-7. FXi POWER SUPPLY REMOVAL AND INSTALLATION
 (Sheet 2 of 2)

5.13.2 CONTROLLER BOARD REMOVAL AND REINSTALLATION

Refer to Figure 5-8. The controller board is attached to left wall of the chassis (as viewed from the front). The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing Controller Board

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Refer to Figure 5-8. Some connectors on rear of chassis are attached to controller board. Use nutdriver to remove screwlocks from rightmost connectors. Remove rear-mounted screw from bottom connector.
3. Note locations of connectors on controller board. Note positions and locations of jumpers so that replacement controller board can be appropriately configured. Remove connectors from controller board.
4. Use Phillips screwdriver to remove screws which hold controller board to side of FXi chassis. Once controller board is free, pull board slightly forward to clear rear connectors. Follow precautions to prepare board for return.

Reinstalling Controller Board

1. Place controller board so that rear connectors protrude through holes in rear of FXi chassis. Make certain that mounting holes in circuit board are aligned with threaded posts on FXi chassis. Use Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
2. From rear of FXi attach screw to lowest connector on rear of controller board. Attach screwlocks to rear-mounted connectors. Do not tighten hardware firmly. Once all hardware is in, tighten all hardware firmly.
3. Set jumpers on replacement board to match settings of removed board. Refer to Figure 5-6. Reattach connectors on controller board. Note that older FXi exciters may have an outdated silk screen on the rear which indicates the functions of REMOTE connector J3. The controller board which you are installing may have revised functions for connections. Refer to Figure 2-7 for details.
4. When all FXi maintenance has been performed, reattach top cover.

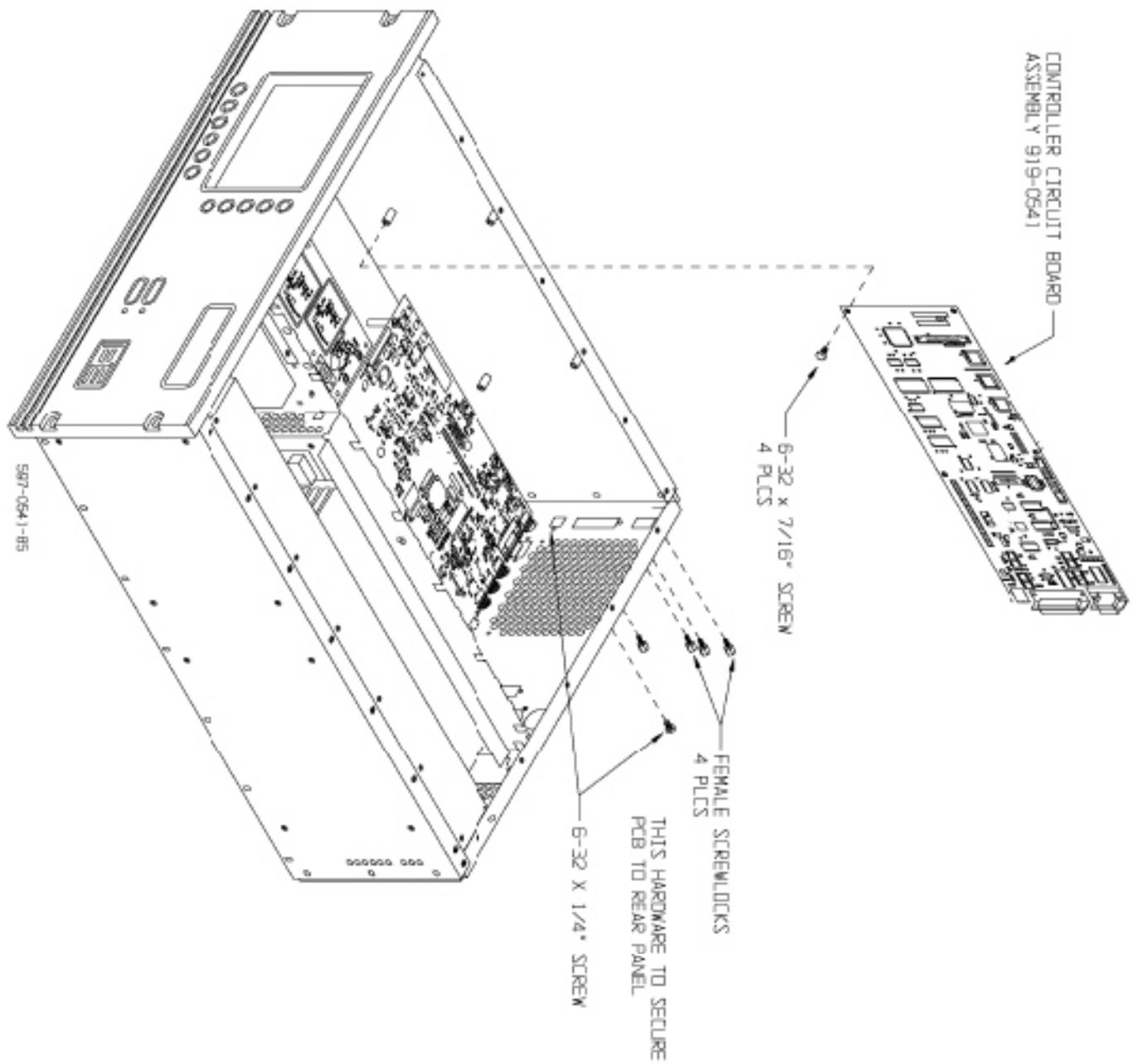


Figure 5-8. FXi CONTROLLER BOARD REMOVAL AND REINSTALLATION
(SHEET 1 OF 2)

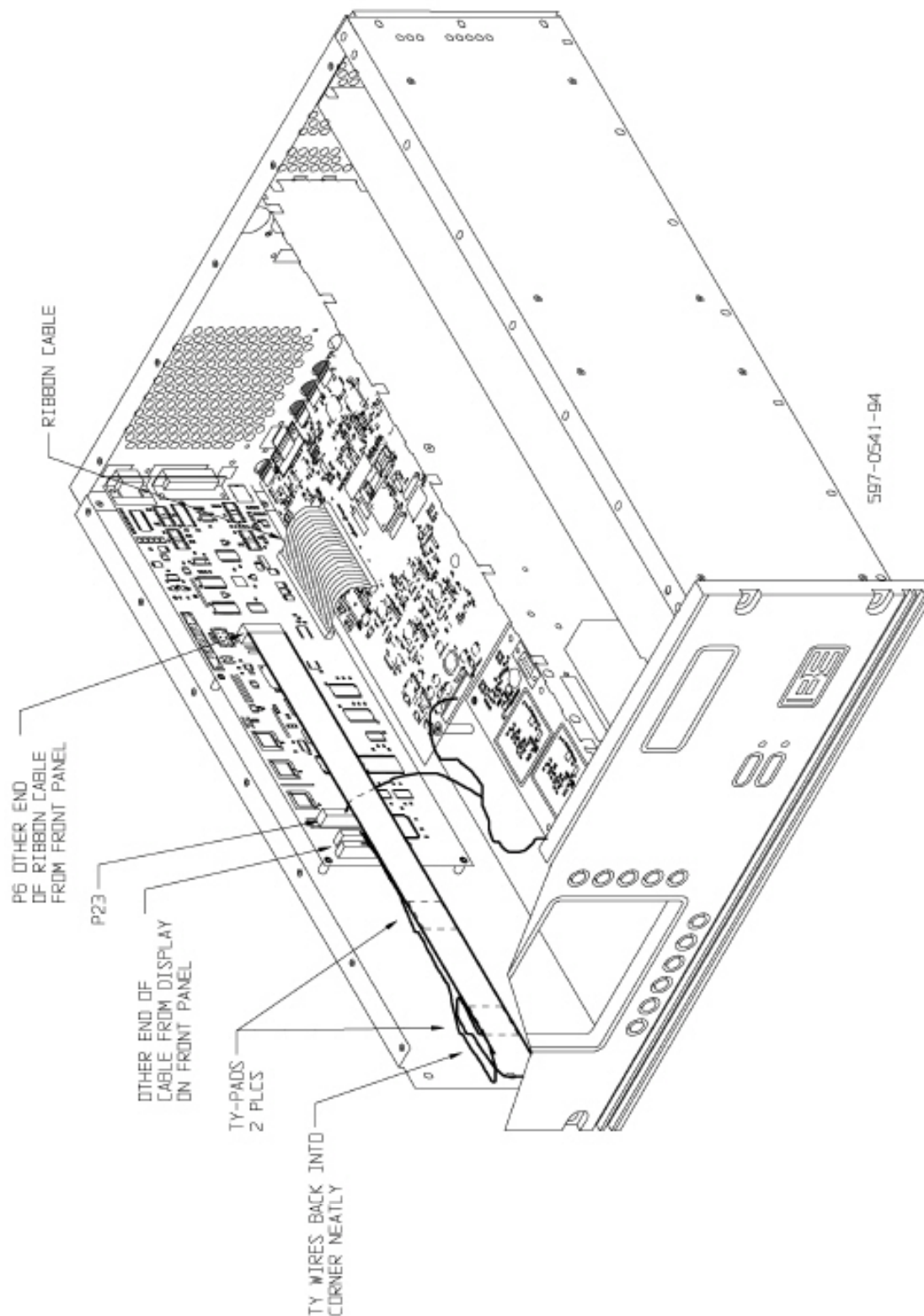


Figure 5-8. FXi CONTROLLER BOARD REMOVAL AND REINSTALLATION
(SHEET 2 OF 2)

5.13.3 DSP BOARD REMOVAL AND REINSTALLATION

Refer to Figure 5-9. The DSP board is attached to bottom of the chassis, near the rear ventilation holes. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing DSP Board

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Note locations of connectors on DSP board. Note positions and locations of jumpers so that replacement DSP board can be appropriately configured. Note firmware revisions on PROMs on DSP board. Remove connectors from DSP board.
3. Some connectors on rear of chassis are attached to DSP board. Retain all hardware. Use nutdriver to remove screwlocks from D-type connector under ventilation screen. Use pliers to remove hardware from BNC connectors. Use Phillips screwdriver to remove screws and cowlings from connectors to left of ventilation screen.
4. Use Phillips screwdriver to remove screws which hold DSP board to bottom of FXi chassis. Once DSP board is free, pull board slightly forward to clear rear connectors. Follow precautions to prepare board for return.

Reinstalling DSP Board

1. Place DSP board so that rear connectors protrude through holes in rear of FXi chassis. Make certain that mounting holes in circuit board are aligned with threaded posts on FXi chassis. Use Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
2. From rear of FXi attach screwlocks to D-type connector on rear of DSP board. Attach hardware to BNC connectors. Push in cowlings and fasten with Phillips screws. Do not tighten hardware firmly. Once all hardware is in, tighten all hardware firmly.
3. Set jumpers on replacement board to match settings of removed board. Refer to Figure 5-6. Reattach connectors to DSP board.
4. When all FXi maintenance has been performed, reattach top cover.



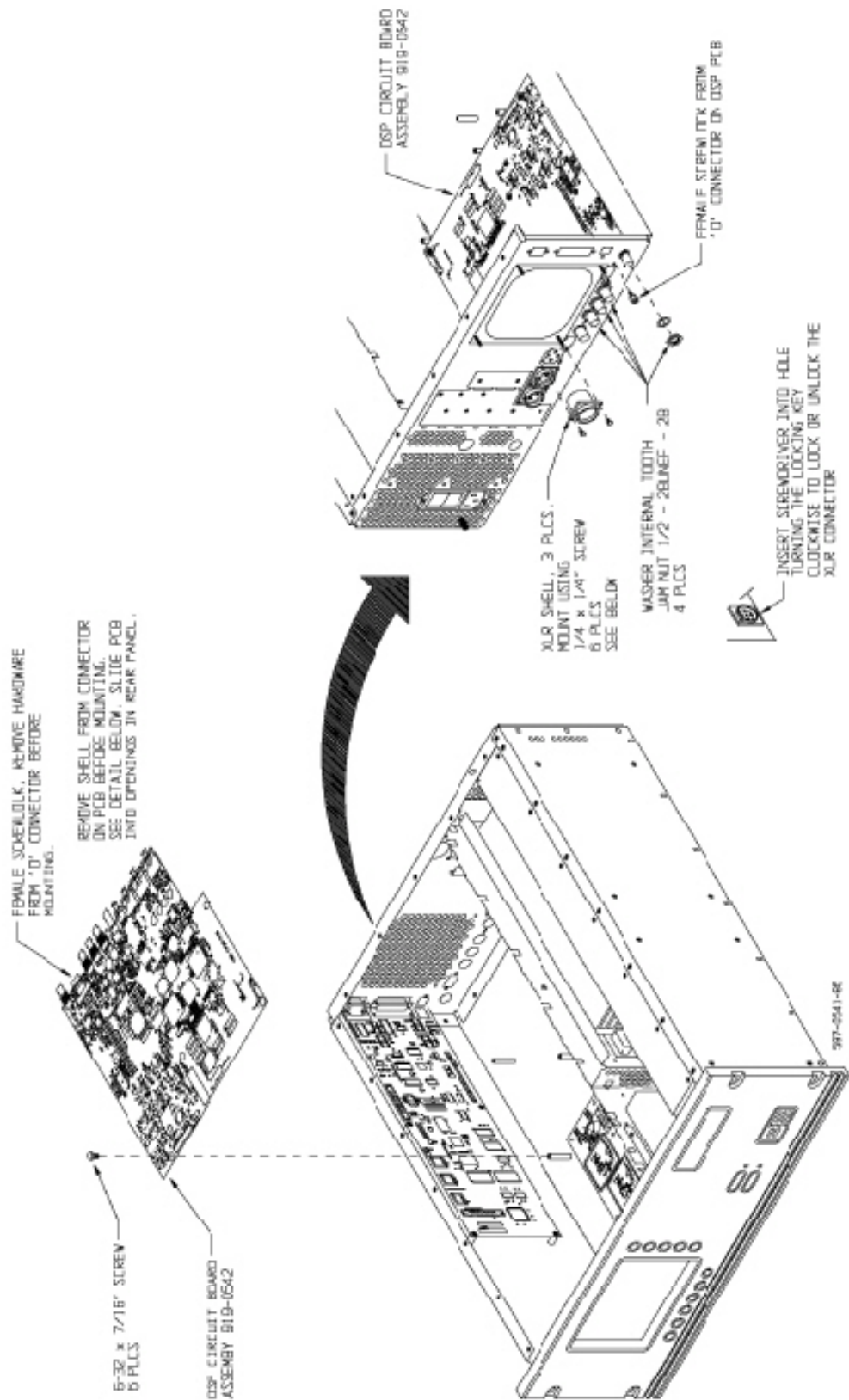


Figure 5-9. FXI DSP BOARD REMOVAL AND REINSTALLATION

5.13.4 OSCILLATOR/FILTER BOARD REMOVAL AND REINSTALLATION

Refer to Figure 5-10. The oscillator/filter board is attached to bottom of the chassis. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing Oscillator/Filter Board

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Note locations of connectors on oscillator/filter board. Note positions and locations of jumpers so that replacement oscillator/filter board can be appropriately configured. Note firmware revisions on PROMs on oscillator/filter board. Remove connectors from oscillator/filter board.
3. Use Phillips screwdriver to remove screws which hold oscillator/filter board to bottom of FXi chassis. Once oscillator/filter board is free, pull board out. Follow precautions to prepare board for return.

Reinstalling Oscillator/Filter Board

1. Place oscillator/filter board so that mounting holes in circuit board are aligned with threaded posts on FXi chassis. Use Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
2. Set jumpers on replacement board to match settings of removed board. Refer to Figure 5-6. Reattach connectors to oscillator/filter board.
3. When all FXi maintenance has been performed, reattach top cover.



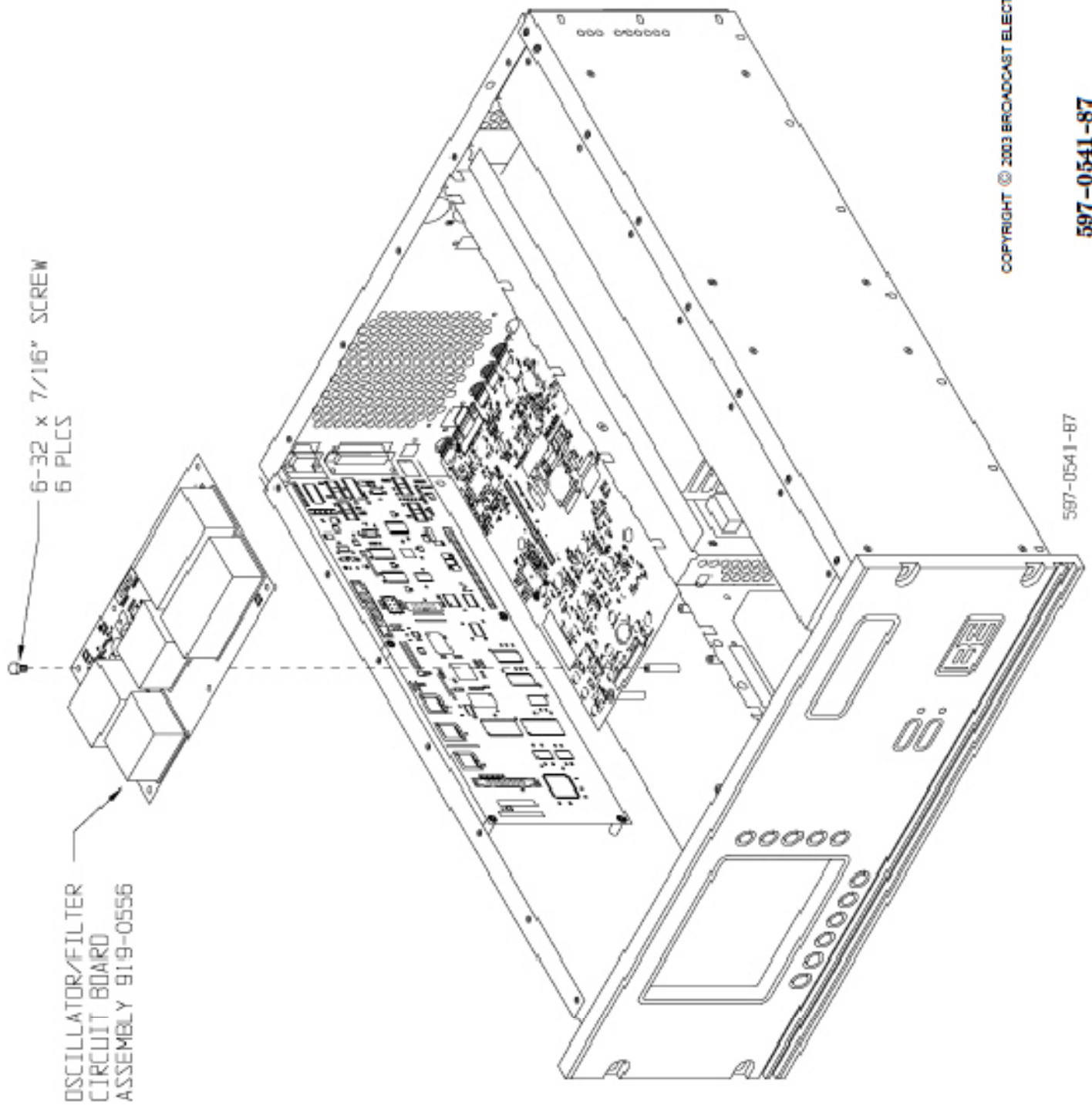


Figure 5-10. FXi OSCILLATOR BOARD REMOVAL AND REINSTALLATION

5.13.5 FRONT-PANEL LCD DISPLAY AND POWER/DISPLAY-CONTROL REMOVAL AND REINSTALLATION

Refer to Figure 5-11. The LCD display is mounted to the inside front of the chassis. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing LCD Display

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Note locations of connectors on LCD display. Remove connectors from LCD display. (It will be necessary to remove L-shaped board under display to remove connections between LCD and L-shaped board.)
3. Retain all hardware. Use Phillips screwdriver to remove screws from corners of LCD display. Now proceed to remove L-shaped power supply board.
4. Use Phillips screwdriver to remove screws which hold L-shaped board to FXi chassis. (if necessary) Once L-shaped board is free, cut ty-raps which hold power wires to LCD display and remove connections from under side of L-shaped board. Follow precautions to prepare board for return.

Reinstalling LCD Display

1. Set DIP switches as shown in Figure 5-11. Remove protective film from display.



WARNING

WARNING

THE LCD DISPLAY OPERATES FROM VOLTAGE IN EXCESS OF 200 VOLTS; THEREFORE CAREFUL ATTENTION TO THE PLACEMENT OF POWER SUPPLY WIRES IS NECESSARY TO PREVENT A HAZARD TO USERS.

2. (if necessary) Attach power connections between LCD display and L-shaped board, red wire to positive (+) on underside of L-shaped board and black to negative (-). Run power connections around to front of board as shown in Figure 5-11 and fasten with ty raps.
3. Place L-shaped board so that mounting holes in circuit board are aligned with threaded posts on FXi chassis. Use Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
4. Place LCD display against chassis so that mounting holes on corners match threaded standoffs and fasten with Phillips screws. Do not tighten hardware firmly. Once all hardware is in, tighten all hardware firmly.
5. When all FXi maintenance has been performed, reattach top cover.



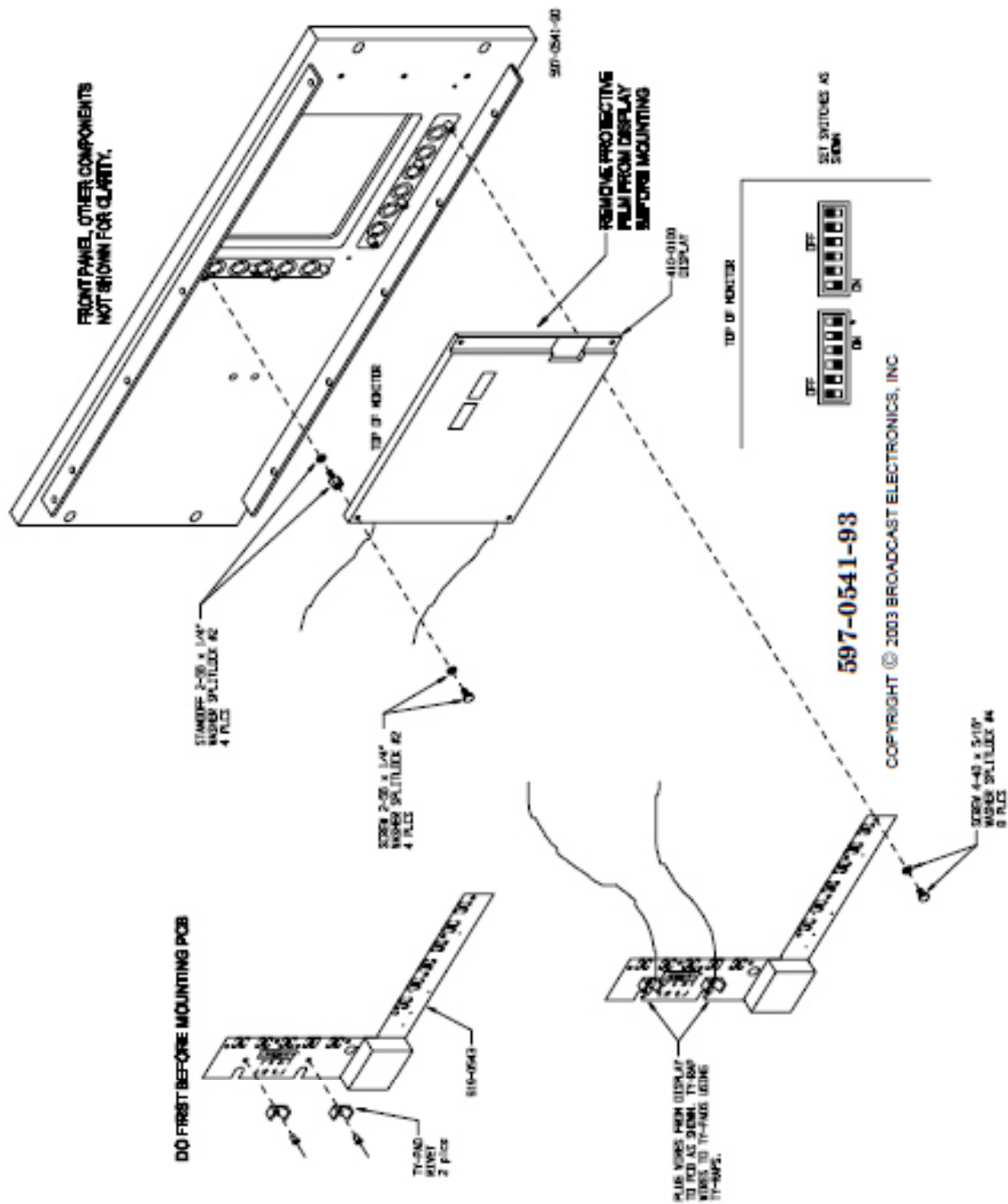


Figure 5-11. FXi FRONT-PANEL LCD DISPLAY REMOVAL AND REINSTALLATION
(SHEET 1 OF 2)

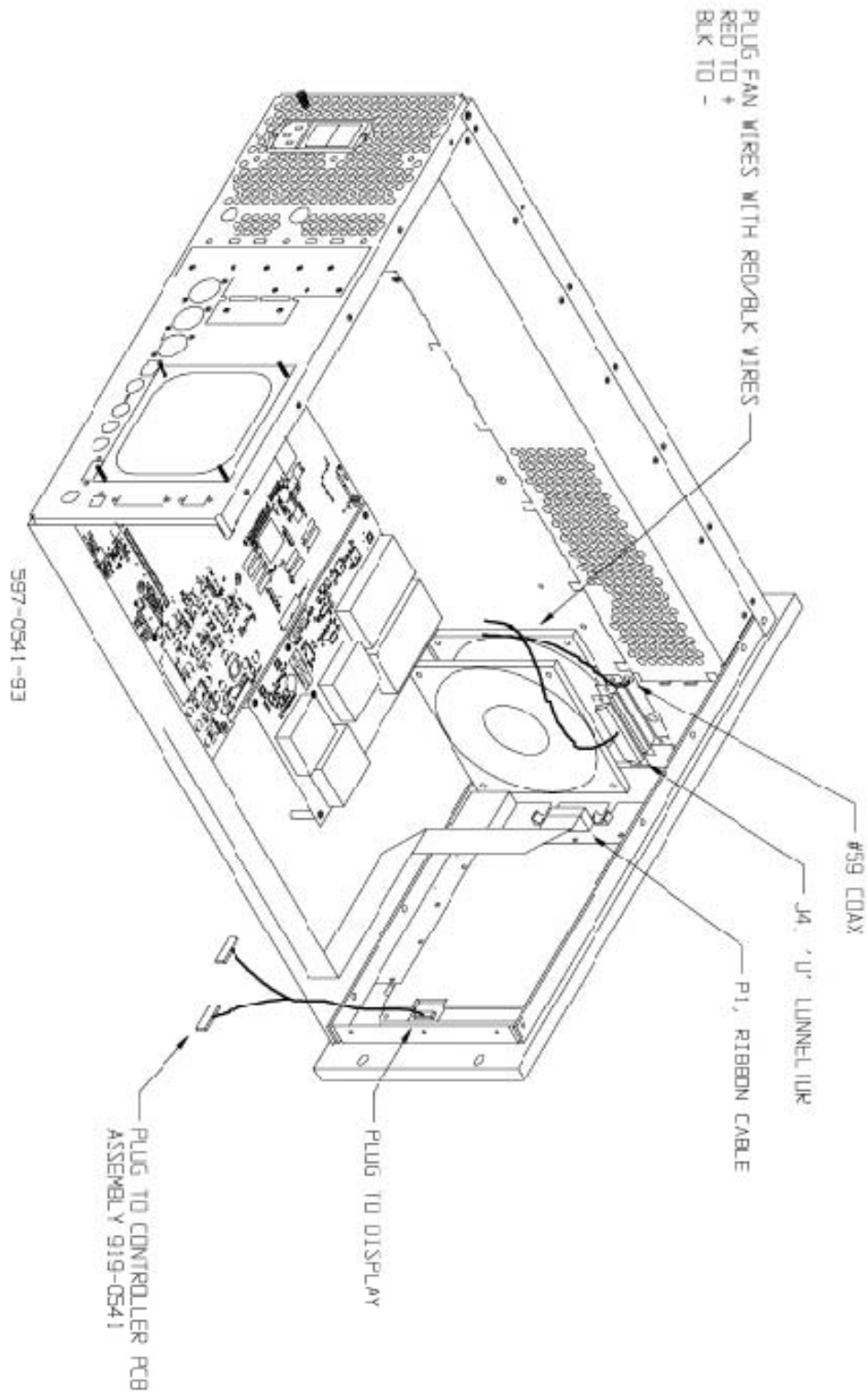


Figure 5-11. FRONT-PANEL LCD BOARD REMOVAL AND REINSTALLATION

(Sheet 1 of 2)

5.13.6 FRONT-PANEL LED BOARD REMOVAL AND REINSTALLATION

Refer to

Figure 5-12. The LED board contains two LEDs which are visible from the front and is attached to the inside front of the chassis. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing LED Board

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. Remove connector from LED board.
3. Retain all hardware. Use Phillips screwdriver to remove screws from top and bottom of LED board. Follow precautions to prepare board for return.

Reinstalling LED Board

1. Place LED board so that mounting holes in circuit board are aligned with threaded posts on FXi chassis. The board fits the chassis only one way. Use Phillips screws to fasten circuit board down. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
2. Replace connector on LED board.
3. When all FXi maintenance has been performed, reattach top cover.

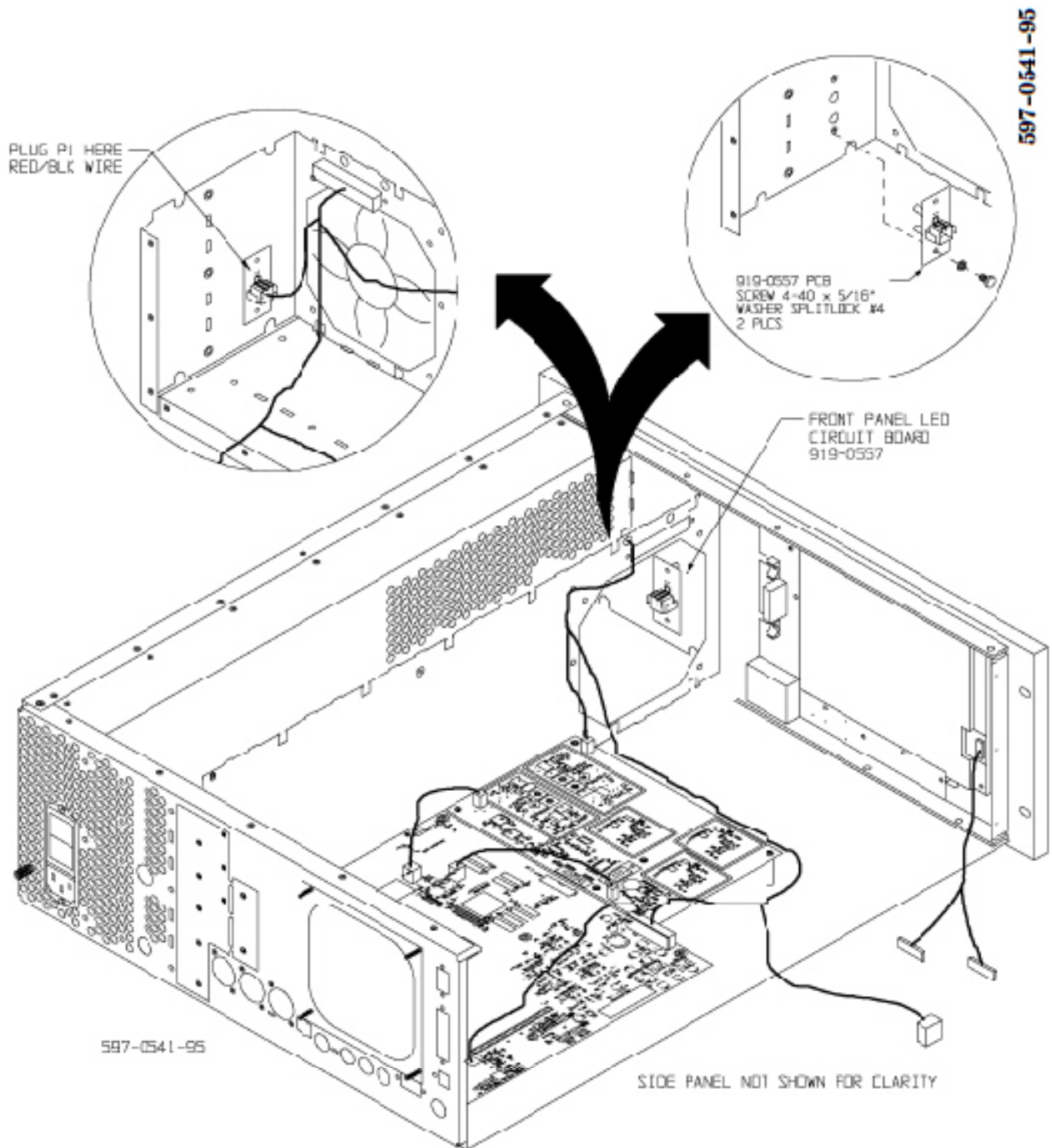


Figure 5-12. FXi LED BOARD REMOVAL AND REINSTALLATION

5.13.7 60/250 W RF PA BOARD REMOVAL AND REINSTALLATION

Refer to Figure 5-13. The RF PA board is mounted between the power supply and the large chassis compartment. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing RF PA Board

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. From rear of FXi exciter: Use pliers or wrench to remove hardware which holds type-N connector and BNC connector. Use Phillips screwdriver to remove screws which secure RF PA board.
3. From inside FXi chassis use Phillips screwdriver to remove 3 screws which are located just left of fan (as viewed from controller board). PA is now loose.
4. Lift PA forward and up so that rear connections clear mounting holes and connectors become accessible.
5. Note connectors on RF PA board, then disconnect connectors so that PA is freed. Follow precautions to prepare board for return.

Reinstalling RF PA Board

1. Place RF PA board so that it is just above its normal location in the chassis. Reattach internal connectors onto PA.
2. Place RF PA board in its normal location so that rear connectors protrude through holes in rear of FXi chassis. Make certain that mounting holes to left of chassis fan are aligned with threaded receptacles on RF PA board. It may be necessary to press down on RF PA board to align screw holes.
3. Use Phillips screws to secure edge of RF PA board with FXi internal wall next to cooling fan. Do not tighten screws firmly. Use Phillips screws to secure rear edge of RF PA board with FXi rear wall. Do not tighten screws firmly. Once all screws are in, tighten all screws firmly.
4. Use pliers or wrench to install hardware which holds type-N connector and BNC connector. Tighten firmly, but do not over tighten.
5. When all FXi maintenance has been performed, reattach top cover.

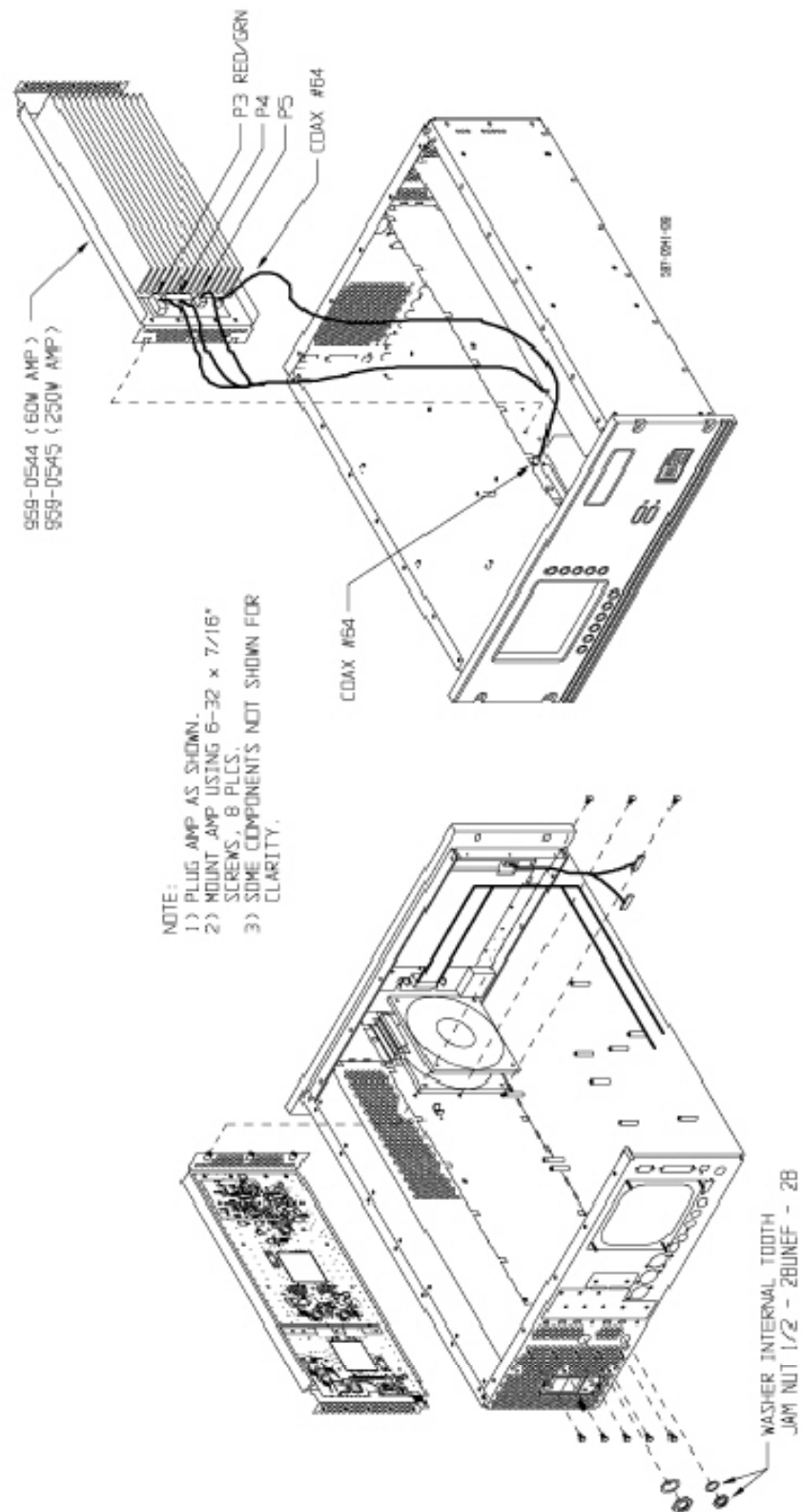


Figure 5-13. FXi 60/250-W AMPLIFIER REMOVAL AND REINSTALLATION

5.13.8 FAN REMOVAL AND REINSTALLATION

Refer to

Figure 5-14. The fan is mounted in the largest chassis compartment. The exciter must be removed from the rack and safely resting on a flat surface before the procedures are performed. All input power to the FXi must be removed.

Removing Fan

1. Use a Phillips screwdriver to remove screws which hold top cover. Remove top cover and set aside. Retain all hardware.
2. From inside of FXi chassis note 2 power lugs with wires under top left (toward rear of chassis) corner of fan. Remove lugs.
3. Use Phillips screwdriver and pliers to remove 4 screws from corners of fan. Fan is disconnected.

5-95. Reinstalling Fan

1. Place fan so that it is in its proper location and that power lugs are under upper left corner. Make certain that mounting holes are aligned.
2. Attach screws and keps as shown in
- 3.
- 4.
5. Figure 5-14.
6. Attach power lugs under upper left corner of fan: red wire to +, black wire to –.
7. When all FXi maintenance has been performed, reattach top cover.

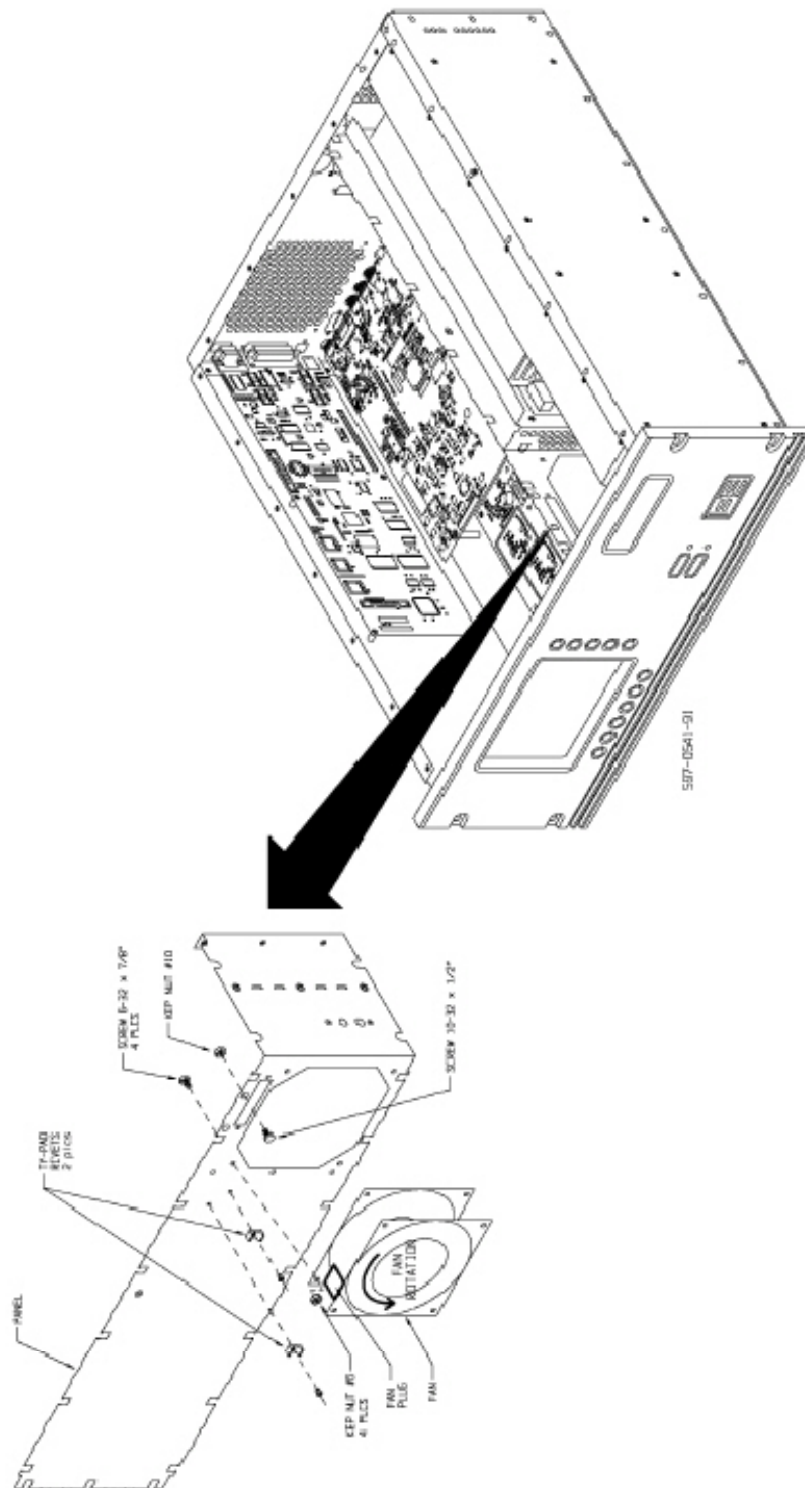


Figure 5-14. FXi FAN REMOVAL AND REINSTALLATION

6 BE PART NUMBERS

This section provides parts lists for the FXi60/250 Exciter. The parts lists provide descriptions and part numbers of electrical components, assemblies, and selected mechanical parts required for maintenance. Each parts list entry in this section is indexed by reference designators appearing on the applicable schematic diagrams.

This bill of material uses an indented structure to show relationships of parts into sub assemblies. Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

6.1 FXi 60 EXCITER

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	909-9060	FXi-60, FM DTC 60W DIGITAL EXCITER		
..1	380-5502	FILTER,FAN	1	
..1	380-8250	FAN,DC GALAXY,24V,15W,150CFM	1	
..1	400-0600	STRIP,QUIET SHIELD,6.00x.197	6	
..1	400-6700	GROMMET STRIP,.062-.090	0.125	
..1	402-0000	TY-RAP	8	
..1	402-0001	TY-RAP,T+B TY24M,1-1/4 DIA	2	
..1	402-0006	MT,ADH BACKED,FOR CBL TIES	2	
..1	402-0008	MTG DEVICE,FOR #6SCR,TIE CBL	4	
..1	410-0100-100	DISPLAY,COLOR LCD,FLAT PANEL,DTC DIGITAL EXCITER	1	
..1	417-3713	CONN,37-PIN/SOCKET ADAPTOR,1000PF C,FILTERED	1	
..1	417-5145-811	MODULE, IEC, AC SW/CB, FILT, 15A, 110/220	1	
..1	420-0508	SCREW,10-32X.500,S.S. FLH	1	
..1	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	5	
..1	420-4103	SCREW,4-40X.187,S.S. PH	4	
..1	420-4105	SCREW,4-40X.312,S.S. PH	18	
..1	420-4204	SCREW,4-40X.250,PH FLH UC	6	
..1	420-6002	SCREW,6-32X.437,S.S. PH FH UC	27	
..1	420-6514	SCREW,6-32X.875,S.S. PH FH	4	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	421-0102	10-32 KEP NUT	1	
..1	421-1003	1/4-20 HEX NUT	1	
..1	421-1113	RIV,CLOSED-END .125 X .316L	4	
..1	421-4008	4-40 KEP NUT	6	
..1	421-6008	6-32 KEP NUT	4	
..1	421-6908	SHEET EDGE CONNECTOR 6-32	30	
..1	421-8028	NUT,JAM,1/2-28 UNEF-2B	5	
..1	422-6106	SCREW,SEMS 6-32 X 3/8 PAN PH. ST."	9	
..1	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	63	
..1	423-1003	1/4-20 LOCK SPLIT	1	
..1	423-4002	#4 LOCK S.S. SPLIT	20	
..1	423-6006	#6 FLAT, 0.75 O.D, 0.140 I.D., 0.062 THK, SST	2	
..1	423-9002	WASH,INT TOOTH,1/2	5	
..1	469-0366	FINGER STOCK (NOTE!!!!!!)	14	
..1	469-0366-2	STRIP,RFI SHIELD 4.25	1	
....2	469-0366	FINGER STOCK (NOTE!!!!!!)	4.25	
..1	471-5326-100	PANEL,FRONT,FXi EXCITER WITH NEW DISPLAY	1	
..1	471-5327	CHASSIS,DTC EXCITER	1	
..1	471-5328	PARTITION,FAN,DTC EXCITER	1	
..1	471-5329	SHIELD,POWER SUPPLY,DTC EXCITER	1	
..1	471-5330-100	PANEL,REAR,DTC EXCITER	1	
..1	471-5333	ANGLE,FRONT PANEL MOUNT,DTC EXCITER	1	
..1	471-5334	COVER,TOP,DTC EXCITER	1	
..1	471-5363	FILLER,DAUGHTER CARD,PLAIN.FXi60/250	1	
..1	471-5367	FILLER,OPTIONS,BLANK,FXi60/250	1	
..1	500-033	Screw, 6 x 1/4 phillips head SM SS type A"	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	500-210	Screw,SEMS 4-40x1/4 Phil Pan Head MS Blk Zinc(external lock)	4	
..1	591-0033	NAMEPLATE,FXi60,DTC EXCITER	1	
..1	591-0036	LABEL,POWER,DTC EXCITER	1	
..1	591-0037	LABEL,FAULT,DTC EXCITER	1	
..1	594-0073	LABEL,WARNING ROTATING FANS	2	
..1	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
..1	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
..1	700-0148	TAPE,JOINING 3/4	0.001	
..1	919-0142	PCB,ASSY,ATTENUATOR,VAR,LO PWR,PNL MTG	1	
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	1	R4
....2	102-3320	RES,CHIP,332 OHMS,1/10W,1%,SMD	2	R2, R3
....2	177-1044	RES,TRMR,1K,25TURN,TOP ADJ	1	R1
....2	417-0259	CONN, BNC PCB MOUNT	2	J1, J2
....2	519-0142	PCB,MACH,ATTENUATOR,VAR,LO PWR,PNL MTG	1	
..1	919-0541-001	PCB, ASSY, CONTROLLER (SBCM)	1	
....2	007-1022	CAP,CER,100pF,50V,2%,SMD	11	C68, C69, C70, C71, C72, C73, C74, C75, C101, C102, C103
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	5	C5, C6, C7, C8, C22

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	69	C1, C2, C3, C4, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C42, C43, C44, C47, C48, C49, C50, C51, C52, C54, C55, C56, C57, C59, C60, C61, C63, C64, C76, C77, C78, C79, C80, C81, C82, C83, C88, C89, C91, C92, C93, C94, C95, C96
....2	007-1054	CAP,CER,1uF,50V,10%,SMD	10	C37, C38, C39, C40, C41, C45, C53, C58, C62, C90
....2	007-3923	CAP,CER,390pF,100V,5%,SMD	1	C46
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	7	C65, C66, C67, C84, C85, C86, C87
....2	070-1065	CAP,TANT,10UF,20V,10%,SMD	8	C104, C105, C106, C107, C108, C109, C110, C111
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	8	R23, R24, R27, R28, R39, R41, R43, R101
....2	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	5	R36, R47, R48, R49, R50
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	1	R37
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	1	R57
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	18	R1, R2, R3, R31, R32, R35, R42, R46, R51, R60, R63, R66, R69, R80, R81, R84, R88, R92
....2	102-1501	RES,1.50K OHM,1/10W,1%	1	R22
....2	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	11	R59, R62, R65, R68, R71, R73, R75, R77, R79, R86, R89

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	2	R45, R53
....2	102-2201	RES,CHIP,22.1 OHM,1/10W,1%	10	R4, R5, R6, R7, R8, R9, R10, R11, R15, R17
....2	102-2210	RES,CHIP,221 OHMS,1/10W,1%,SMD	2	R54, R58
....2	102-2431	RES,CHIP,2.43K OHMS,1/10W,1%,SMD	1	R33
....2	102-2743	RES,CHIP,274 OHM,1/10W,1%,SMD	2	R13, R14
....2	102-3302	RES,CHIP,33.2 OHMS,1/10W,1%,SMD	2	R25, R26
....2	102-3304	RES,CHIP,3.3M,1/10W,10%,SMD	11	R61, R64, R67, R70, R72, R74, R76, R78, R85, R87, R90
....2	102-3832	RES, CHIP, 38.3 KOHMS, 1/10W, 1%, SMD	3	R82, R83, R91
....2	102-4421	RES,CHIP,4.42K OHMS,1/10W,1%,SMD	1	R29
....2	102-5041	RES,4.99K OHM,1/10W,1%	1	R30
....2	102-5143	RES,5.1K OHMS,1/10W,1%,SMD	4	R12, R16, R52, R100
....2	102-9311	RES,9.31K OHMS,1/10W,1%,SMD	1	R34
....2	198-1054	TRMR,10K OHMS, TOP ADJ, SMD (N)	2	R40, R44
....2	204-0914	DIODE, SWITCHING, MMBD914LT1, SMD	2	D1, D2
....2	210-3906-001	TSTR, 3906, SMD	2	Q1, Q4
....2	216-0074	IC, TL074CD, QUAD OP AMP, SMD	3	U27, U28, U29
....2	216-0301	MOSFET, NCH, 25V, LO VTH, SOT23	1	Q3
....2	216-7002	IC, MOSFET, 2N7002LT1, SMD	2	Q2, Q5
....2	224-0011	IC, USB TRANSCEIVER, LV, SMD	1	U15
....2	224-0116	IC, 16 MEG SDRAM, SMD	2	U13, U14
....2	224-0160	IC, PAGE FLASH, 16 MEG, SMD (NOTE D.N.S.)	1	U12
....2	224-0708	IC, MICRO SUPERVISOR, 3V, SMD	1	U4
....2	224-0905	IC, CLOCK BUFFER, LV, SMD	1	U5
....2	224-2210	IC, PAL, 22LV10, LOW V, SMD	3	U17, U18, U20
....2	224-2410	IC, RS-232 MULTI-TRANSCEIVER, +5V, SMD	1	U16

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	224-3806	IC, LCD DISPLAY CONTROL, SMD	1	U37
....2	224-5272	IC, MICROPROCESSOR, MCF5272	1	U1
....2	224-6245	IC, 16 BIT TRANSCEIVER, SMD	4	U7, U8, U9, U21
....2	224-6373	IC, 16 BIT LATCH, LV, SMD	4	U30, U31, U32, U40
....2	224-7225	IC,QUAD D/A,8 BIT,TLC7225	1	U26
....2	224-7548	IC, D/A CONVERTER, 12 BIT, PLCC	1	U22
....2	224-7733	IC, POWER SUPERVISOR, 3.3V	1	U3
....2	226-4740	RES NET,4.7K,10-PIN,.1 SPACE	7	R18, R19, R20, R21, R38, R55, R56
....2	227-1585	VR,LT1585CT-3.3,3.3V,TO-220	1	U38
....2	229-0033	IC,OPTOIS,4N33	5	U24A, U35A, U35B, U36A, U36B
....2	229-0111	IC,AC INPUT OPTO-ISOLATOR	6	U19A, U19B, U33A, U33B, U34A, U34B
....2	229-0158	IC,A/D AND MUX,SMD	2	U23, U25
....2	229-9366-001	IC,CMOS SERIAL EEPROM,4K,93C66	1	U6
....2	231-0136	IC,VOLT REF,2.5V,8-PIN SOIC	1	D3
....2	231-7905	VR,LM79L05AC,NEG VOLT,100mA,SMD	1	U39
....2	270-1254	REL,12V 2PDT	1	K1
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	2	DS1, DS2
....2	340-0004	SW,JUMPER PROGRAMMABLE	7	P8, P14, P15, P16, P17, P20, P24
....2	342-3304	SW,TACT,SPST,N.O.,SMD,RECESSED	2	S1, S2
....2	390-4800	OSCILLATOR, 48.00 MHZ	1	U11
....2	390-6600	OSCILLATOR, 66.00 MHZ	1	U10
....2	408-6000	CONNECTOR, HEADER, 60 PIN, SMD	1	J5
....2	413-0106	TERM,TEST POINT,OVAL,RED	2	TP1, TP2
....2	417-0189	CONN,9PIN MALE,RTANG,PCB MT	1	J10
....2	417-0200	CONN,HEADER 20 PIN	1.5	J8, J9, J11, J13, J14, J15, J16, J17, J20, J24

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-0315	CONN,USB TYPE B" RECEPTACLE, PCB MOUNT"	1	J12
....2	417-0677	CONN,PCB MT,6PIN MALE	1	J7
....2	417-1128	CONNECTOR HEADER, 28 PIN, 2MM	1	J22
....2	417-1132	CONNECTOR HEADER, 32 PIN,2MM	1	J21
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J6
....2	417-8925	CONN, 25 PIN,D, FEMALE, R.A. FILTERED	1	J3
....2	418-0255	CONN,MALE,4PIN	1	J25
....2	418-2602	CONN,PCB MALE HEADER,26 POS	1	J1
....2	418-2602-001	CONN,HEADER,26 PIN,LATCH/EJECT,PCB	1	J23
....2	420-4106	SCREW,4-40X.375,S.S. PH	2	
....2	421-4008	4-40 KEP NUT	2	
....2	431-1400	SOCKET,14-PIN,DIP,SMD	6	U19A, U19B, U24A, U33A, U33B, U34A, U34B, U35A, U35B, U36A, U36B
....2	431-1600	SOCKET,16-PIN,DIP,SMD note	1	XK1
....2	519-0541-001	PCB, MACH, CONTROLLER	1	
..1	919-0542	PCB, ASSY, DSP, DTC DIGITAL EXCITER (SBCM)	1	
....2	006-1075	CAP,LYTIC,10uF,50V,20%,SMD note	13	C604, C605, C606, C607, C608, C609, C611, C613, C614, C615, C616, C686, C693
....2	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	1	C681
....2	006-1085	CAP,ELECTRO,100 UF,10%,35V,SMD	4	C641, C648, C655, C662
....2	006-4775-350	CAP,ELECTRO,47UF,20%,35V,SMD	3	C610, C612, C685
....2	007-0010	CHIP CERAMIC 10pF 50V 5% 0603 SMD	4	C255, C256, C257, C258
....2	007-0330	CAP,CER,.33UF,+80,-20%,16V,0603,SMD	4	C26, C45, C56, C206
....2	007-0560	Chip Ceremac, 560pF 50v 5% 1206 SMD	1	C243

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-0683	CAP CERAMIC, 0.068uF, 50v, SMD, 0805	1	C506
....2	007-1012	CAP,CER,10pF,50V,2%,SMD	3	C617, C671, C672
....2	007-1013-050	CAP,CER,100 PFD,5%,50V,0603,SMD	2	C269, C270
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	5	C522, C675, C676, C677, C678
....2	007-1034	CAP,CER,0.01uF,50V,10%,SMD	27	C3, C502, C503, C504, C505, C525, C526, C531, C532, C541, C542, C556, C557, C558, C592, C593, C619, C629, C630, C620, C665, C667, C669, C687, C688, C689, C690
....2	007-1040-025	CAP,CER,.1UF,+80,-20%,25V,0603,SMD	131	C1, C2, C15, C16, C17, C24, C25, C30, C31, C35, C36, C37, C38, C39, C40, C48, C49, C50, C51, C52, C53, C54, C55, C57, C58, C59, C61, C62, C63, C66, C74, C75, C76, C78, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C104, C105, C106, C107, C108,

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	56	C18, C501, C507, C509, C511, C513, C515, C519, C520, C537, C539, C543, C544, C545, C546, C547, C548, C549, C551, C552, C553, C554, C555, C559, C560, C561, C562, C563, C564, C568, C569, C570, C577, C579, C580, C583, C584, C587, C589, C595, C598, C599, C600, C601, C602, C603, C622, C624, C626, C635, C642,
....2	007-1054	CAP,CER,1uF,50V,10%,SMD	8	C638, C640, C645, C647, C652, C654, C659, C661
....2	007-1054-002	CAP,CER,1000PF,+80,-20%,50V,0603,SMD	4	C125, C236, C238, C272
....2	007-1201-050	CAP,CER,12 PFD,5%,50V,1206,SMD	3	C291, C292, C523
....2	007-1512	CAP,CER,15pF,50V,2%,SMD	1	C571
....2	007-1800-006	CAP,1800pF,50V,10%,SMD,0603	1	C597
....2	007-2202-051	CAP,CER,22PF,5%,50V,0603,SMD	2	C218, C220
....2	007-2705	CAP,CER,.027UF,10%,50V,1206,SMD	2	C239, C240
....2	007-3300	CAP,CER,3.3PF,50V,.25pF,SMD	2	C528, C529
....2	007-3913-050	CAP,CER,39 PF,5%,50V,1206,SMD	4	C130, C131, C132, C133
....2	007-3923	CAP,CER,390pF,100V,5%,SMD	8	C517, C518, C637, C644, C651, C658, C673, C674
....2	007-4700-501	CAP,CER,4.7NF,10%,50V,0603,SMD	5	C208, C209, C210, C211, C254
....2	007-4724	CAP,CER,0.047uF,50V,10%,SMD	1	C253
....2	007-6800-501	CAP,CER,6.8nF,10%,50V,0603,SMD	1	C250
....2	007-6812-001	CAP,CER,68PF,5%,50V,0603,SMD	2	C214, C215



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	009-0200	CAP,TANTALUM CHIP,10UF,POLAR,10%,25V,SMD	7	C7, C8, C11, C12, C13, C14, C249
....2	009-0201	CAP,TANTALUM CHIP,10UF,POLAR,10%,10V	18	C19, C20, C21, C22, C23, C27, C33, C34, C41, C42, C44, C46, C207, C212, C213, C260, C261, C682
....2	009-0202	CAP,TANALUM CHIP,100UF,POLAR,10%,6V,SMD	1	C67
....2	009-0204	CAP,TANTALUM CHIP,47UF,POLAR,10%,6V,SMD	2	C231, C232
....2	009-0206	CAP,TANTALUM CHIP,15UF,POLAR,10%,10V,SMD	1	C60
....2	020-1085	CAP,LYTIC,100UF,50V,STDUP,NP	6	C508, C510, C514, C516, C679, C680
....2	020-3385	CAP,LYTIC,330UF,25V,NP	3	C521, C540, C578
....2	070-0220	Cap,Tantalum Chip 220uF 10V 10% 7343H SMD	2	C68, C332
....2	070-1054	CAP,TANT,1uF,35V,10%,SMD	14	C538, C576, C581, C582, C585, C586, C588, C590, C618, C621, C623, C625, C627, C670
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	22	C524, C527, C530, C533, C535, C536, C565, C566, C567, C572, C573, C591, C594, C628, C631, C632, C633, C634, C663, C664, C691, C692
....2	070-1084-L16	CAP,TANT,100 MFD,20%,16V,E CASE,LOW ESR,SMD	4	C636, C643, C650, C657
....2	070-2265-L25	CAP,TANT,22 MFD,20%,25V, E CASE,LOW ESR,SMD	4	C639, C646, C653, C660
....2	101-0150	Resistor,150 ohm 1/2W 5% SMD 2010	1	R661
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	5	R600, R623, R703, R915, R916

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	13	R137, R505, R506, R507, R508, R513, R514, R515, R516, R523, R524, R525, R526
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	48	R190, R191, R192, R555, R556, R557, R558, R559, R560, R561, R562, R564, R566, R570, R575, R577, R579, R581, R583, R585, R586, R587, R588, R589, R590, R592, R593, R595, R596, R602, R603, R604, R605, R609, R610, R635, R636, R641, R642, R648, R649, R655, R656, R677, R678, R701, R627, R629
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	43	R503, R511, R519, R520, R521, R529, R530, R533, R534, R535, R536, R537, R538, R544, R545, R546, R547, R548, R549, R551, R552, R553, R554, R597, R599, R626, R632, R638, R643, R645, R650, R652, R657, R662, R663, R668, R669, R670, R671, R692, R693, R694, R695
....2	102-1004	RES,CHIP,1.00M OHMS,1/10W,1%,SMD	6	R509, R510, R517, R518, R527, R528
....2	102-1063	RES,CHIP,100K OHMS,1/10W,5%,SMD	3	R531, R532, R700
....2	102-1133	RES,CHIP,110 OHMS,1/10W,1%,SMD	1	R501
....2	102-1200	RES,CHIP,121 OHMS,1/10W,1%,SMD (NOTE)	2	R612, R616
....2	102-1214	RES, CHIP, 1.21K OHM, 1/10W, 1%	2	R136, R653



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1582	RES,CHIP,15.8 K, 1/10 W, 1%	7	R624, R625, R631, R633, R637, R644, R651
....2	102-1691	RES,CHIP,1.69K OHMS,1/10W,1%,SMD	1	R543
....2	102-1780	RES,CHIP,178 OHMS,1/10W,1%,SMD	1	R914
....2	102-2430	RES,CHIP,243 OHMS,1/10W,1%,SMD, 0805	2	R674, R676
....2	102-2431	RES,CHIP,2.43K OHMS,1/10W,1%,SMD	1	R646
....2	102-2741	RES,CHIP,2.74K OHMS,1/10W,1%,SMD	2	R628, R630
....2	102-3011	RES,CHIP,3.01K OHMS,1/10W,1%,SMD	18	R563, R565, R567, R568, R569, R571, R572, R573, R574, R576, R578, R580, R582, R584, R594, R606, R620, R622
....2	102-3160	RES,CHIP,3.16K OHMS,1/10W,1%,SMD	7	R539, R540, R541, R542, R613, R617, R696
....2	102-3653	RES,CHIP,365 OHM,1/10W,1%	5	R611, R614, R615, R618, R697
....2	102-4750	RES,CHIP,475 OHMS,1/10W,1%,SMD	1	R502
....2	102-5041	RES,4.99K OHM,1/10W,1%	6	R634, R640, R647, R654, R672, R673
....2	102-5112	RES,CHIP,51.1 OHM,1/10W,1%	3	R522, R621, R666
....2	102-8164	RES, CHIP, 8.66K OHM, 1/10W, 1% ,CR21-8661F-T	1	R639
....2	102-8251	RES,8.25K OHMS,1/10W,1%,SMD	1	R598
....2	104-0000	RES,CHIP,0 OHM JUMPER,0603,SMD	7	R99, R100, R102, R123, R195, R681, R682
....2	104-0010	RES,CHIP,10.0 OHM,1%,1/16W,0603,SMD	3	R26, R95, R212
....2	104-0022	RES,CHIP,22.1 OHM,1%,1/16W,0603,SMD	14	R21, R23, R24, R25, R32, R35, R42, R43, R76, R81, R82, R89, R90, R91
....2	104-0049	RES,CHIP,49.9 OHM,1%,1/16W,0603,SMD	5	R8, R9, R10, R130, R239



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-0100	RES,CHIP,100 OHM,1%,0.10W,0603,SMD	9	R29, R83, R84, R85, R86, R187, R188, R189, R208
....2	104-0220	RESISTOR,221ohm,1/16W,SMD,0603	1	R92
....2	104-0392	RES,CHIP,392 OHMS,1%,1/16W,0603,SMD	1	R16
....2	104-0634	RES,CHIP,634 OHMS,1%,1/10W,0805,SMD	2	R504, R512
....2	104-1001	RES,CHIP,1.0 K OHM,1%,1/16W,0603,SMD	58	R11, R12, R13, R14, R15, R47, R48, R52, R53, R54, R55, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R79, R103, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R126, R133, R134, R145, R164, R172, R175, R659, R660, R689, R6
....2	104-1002	RES,CHIP,10.0 K OHM,1%,1/16W,0603,SMD	3	R87, R88, R101
....2	104-1500	RES,CHIP,1.5 KOHM,1%,1/16W,0603,SMD	2	R122, R128
....2	104-2200	RES,CHIP,2.21KOHM,1%,1/16W,0603,SMD	4	R19, R20, R104, R129
....2	104-2201	RES,CHIP,22.1Kohm,1%,1/16W,0603,SMD	4	R77, R78, R165, R166
....2	104-3301	RES,CHIP,3.32Kohm,1%,1/16W,0603,SMD	2	R201, R203
....2	104-3320-001	RES,CHIP,332 OHM,1%,1/16W,0603,SMD	3	R18, R132, R225
....2	104-4700	RES,CHIP,475 OHM,1%,1/16W,0603,SMD	4	R160, R161, R162, R163
....2	104-4701	RES,CHIP,4.75KOHM,1%,1/16W,0603,SMD	16	R5, R22, R27, R40, R41, R44, R45, R46, R49, R50, R51, R56, R96, R147, R238, R690
....2	104-4702	RES,CHIP,47.5Kohm,1%,1/16W,0603,SMD	2	R131, R186



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-6000	RES,604 OHM,1%,1/16W,0603,SMD	3	R93, R94, R124
....2	104-6004	RES,60.4 OHM,1%,1/16W,0603,SMD	1	R169
....2	104-6810	RES,CHIP,681 OHM,1%,1/16W,0603,SMD	2	R2, R17
....2	104-8200	Chip Res, 8.25K 1% 1/16W 0603 SMD	1	R204
....2	105-1010	RES, CHIP, 100 OHM, 1W, 5%, 2512, SMD	1	R913
....2	198-5034	TRMR,500 OHMS,TOP ADJUST,SMD	1	R608
....2	201-0012-001	TRANSIENT VOLTAGE SUPPRESSION DIODE, 10v	11	D503, D504, D505, D506, D507, D508, D509, D510, D511, D512, D513
....2	204-0130	SCHOTTKY BARRIER RECTIFIER 1 AMP 30V CASE 403A SMD	4	D518, D520, D522, D524
....2	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	12	D26, D27, D501, D502, D514, D515, D516, D517, D519, D521, D523, D525
....2	204-2800	DIODE,SCHOTTKY,HSMS-2800,SOT-23	1	D28
....2	210-0093	TRANSISTOR,BFR93A,SOT-23,SMD	3	Q509, Q510, Q511
....2	216-3800	IC, OP AMP,QUAD, SINGLE SUPPLY RAIL TO RAIL I/O, SO-14	1	U29
....2	216-3801	IC, DUAL RF FREQUENCY SYNTHESIZER, TSSOP-20	1	U30
....2	216-3904	TSTR,MMBT3904LT1,NPN,SMD	3	Q506, Q507, Q508
....2	216-4071	IC,MC14071BD,QUAD 2-INPUT OR,SMD	1	U502
....2	216-4227	IC,OPA4227UA,QUAD OP AMP,SO-14,SMD	4	U3, U4, U5, U6
....2	216-7002	IC,MOSFET,2N7002LT1,SMD	8	Q501, Q502, Q503, Q504, Q505, Q512, Q513, Q515
....2	216-7400	IC,SN74AHCT1G00DBV,2-INPUT POS NAND,DBV,SMD	4	U13, U505, U508, U527
....2	220-4052-002	IC,4052 DUAL 4-CH MUX,SMD	2	U506, U507
....2	221-1105	MMIC,MSA-1105,17DBM,50 OHM	1	U526
....2	221-2134-001	RAIL TO RAIL I/O OPAMP DUAL SO8	2	U503, U528



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	224-0138	IC,74ACT138,3 TO 8 DECODER,SMD note	2	U515, U516
....2	224-0708	IC, MICRO SUPERVISOR, 3V, SMD	1	U39
....2	224-1180	IC,DUAL RS232 DRIVER/RECIEVER,18 PIN,S0-18	1	U37
....2	224-1808	DIGITAL POTENTIOMETER, DS1808Z-050	3	U509, U512, U513
....2	224-1852	IC, DAC, STERIO, 24 BIT, 192KHZ, 28 PIN, SSOP	1	U10
....2	224-1896	IC,SAMPLE RATE CONVERTER,STEREO,ASYNCH,192 KHZ,28 PIN,SSOP	1	U18
....2	224-2227	IC,LOW NOISE OP AMP,8 PIN,S0-8	1	U9
....2	224-3200	IC,STEREO AUDIO CODEC,24 BIT,96KHZ,28 PIN DB,SSOP	1	U21
....2	224-4456	IC, FPGA, VIRTEX-II 1.5V,456-PIN, BGA	2	U8, U14
....2	224-6711	IC,FLOATING POINT DSP,150MHZ,256 PIN,BGA (NOTE D.N.S.)	1	U22
....2	224-8138	IC,DIFFERENTIAL ADC DRIVER,8 PIN,SO-8	1	U2
....2	224-8414	IC, 96 KHZ DIGITAL AUDIO RECEIVER	1	U501
....2	224-9260	IC,ADC W/16 BIT RESOLUTION,2.5MHZ WORD RATE,44 PIN,MQFP	1	U1
....2	224-9772	IC, AD9772A, 14-BIT DAC, 48-LEAD LQFP	1	U12
....2	226-1000	Res Network, 1K,8 pin, SMD	1	RN1
....2	226-4701	Res Network, 4.7K ohm, 8 pin, SMD	2	RN2, RN3
....2	226-4744	RES NET,4.7K,1%,1.13W,9 PIN SIP	1	RP1
....2	227-0317	VR,LM317T,LM317KC	2	U517, U529
....2	227-0337	VOLTAGE REGULATOR,3 TERM, NEG	2	U519, U520
....2	227-1085	VR, LT1085IT, 3A, LOW DROPOUT, TO-220	1	U521
....2	227-1576	VR, LT1576IS8, SWITCHER, 1.5A, SMD	4	U522, U523, U524, U525
....2	270-0065	REL,SPDT,12VDC,DIP	1	K503
....2	270-0065-001	REL,SPDT,12VDC,HIGH ISOLATION,DIP	1	K504
....2	270-0066	REL,DPDT,12VDC,DIP	2	K501, K502

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	270-222-001	CAP,CER,2200PF,10%,50V,0603,SMD	1	C222
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	4	DS501, DS502, DS503, DS504
....2	339-0102	CAP, 1000pF, 50V, 20%, 2706	2	FL508, FL509
....2	339-0222	FILTER,EMI,2200PF,SMD	6	FL503, FL504, FL505, FL506, FL507, FL510
....2	340-0004	SW,JUMPER PROGRAMMABLE	9	P4, P12, P19, P27, P30, P506, P509, P515, P529
....2	350-197	INDUCTOR, SMT, POWER, 1uH	8	L511, L513, L514, L516, L517, L519, L520, L522
....2	360-0125-001	Inductor 68uH SMD	4	L512, L515, L518, L521
....2	360-0165	IND, .78 UH, 15A	1	L505
....2	360-0167	IND, .56 UH, 6A	6	L504, L506, L507, L508, L509, L524
....2	366-0011	IND,10UH,SHIELDED,SMD	3	L502, L503, L523
....2	366-0014	INDUCTOR,0.82 uH,CHIP,SMD	1	L525
....2	366-0015-001	IND,1.5 UH,10%,1210,SMD	2	L29, L30
....2	366-2204	IND,22 uH,10%,LQH3C220K04,1210,SMD	5	L1, L9, L20, L13, L14
....2	366-4724	IND,4.7 uH,10%,LQH1N4R7K04M00,1206,SMD	4	L25, L26, L27, L28
....2	367-9370	XFMR,SMT,AES/EBU,SC937-02	1	T501
....2	375-0020	TRANSFORMER, RF, 1:1, 0.3-200MHZ, SM-22 PACKAGE	3	T1, T2, T502
....2	390-0062	CRYSTAL, 12MHZ, +/-50 PPM TOLERANCE, SMD	1	Y6
....2	390-1115	OSC,XTAL,10.000MHZ,MODEL T-1115	1	Y501
....2	390-3072	OSC, VCXO,30.72 MHZ	1	U27
....2	390-6144	CRYSTAL, 6.144MHz, 50PPM, CLOCK OSCILLATOR	1	Y502



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	3	U504, U510, U511
....2	408-6000	CONNECTOR, HEADER, 60 PIN, SMD	1	J505
....2	413-0603	Chip,Test Point 0603 SMD	192	TP1, TP2, TP3, TP4, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP19, TP20, TP21, TP22, TP42, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP50, TP51, TP52, TP53, TP54, TP55, TP56, TP58, TP59, TP60, TP61, TP62, TP65, TP66, TP67, TP68, TP69, TP70, TP71, TP72, TP73, TP75, TP76, TP78, TP
....2	417-0265	CONN,BNC,JACK,THREADED,PC EDGE MOUNT,LOW PROFILE	4	J512, J514, J518, J520
....2	417-0266	CONN,BNC,JACK,PC EDGE MOUNT,LOW PROFILE	1	J513
....2	417-0308	CONN,JACK,3-PIN,SMD	6	J4, J506, J509, J515, J529, JP30
....2	417-0506	6 pin single row header .1 center	4	JP3, JP4, JP31, JP32
....2	417-0512	12 pin header	1	JP13
....2	417-0903	RCPT, 9 PIN D, FEMALE	1	J9
....2	417-1093-001	CONN,RECP,DB-9,FILTERED,RT.ANGLE,4-40,PCB MT	1	J519
....2	417-1603	CONN,HEADER 16-PIN,DUAL 8-PIN	12	JP5, JP6, JP7, JP8, JP9, JP10, JP11, JP12, JP14, JP15, JP16, JP26
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	JP526
....2	417-1701	STRAIGHT JACK RECEPTACLE,SMB PCB MOUNT 50 OHM	4	J2, J3, J527, J510
....2	417-4004	CONN,HEADER,2 PIN	1	JP19

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-6013	MODULE,FIBRE OPTIC RECIEVER,TORX173	1	J504
....2	418-0051	CONN,AUDIO PC 3 PIN FEM E3FRAB	3	J501, J502, J503
....2	418-0902	CONN, SOCKET,80 POSITION,DOUBLE ROW, .8MM,SMD	1	J507
....2	431-1400	SOCKET,14-PIN,DIP,SMD	2	XK503, XK504
....2	431-1600	SOCKET,16-PIN,DIP,SMD note	2	XK501, XK502
....2	431-3200	SOCKET,32-PIN,PLCC,SMD note	2	XK24, XK25
....2	431-4400	SOCKET,44-PIN,PLCC,SMD note	3	XK11, XK38, XK41
....2	455-0037	HEATSINK,AAVID 530101B00150,PCB MNT W CLIP	1	XU521
....2	455-0071	HEATSINK,CLIP-ON,PCB MT,TO-220	4	XU517, XU519, XU520, XU527
....2	519-0542	PCB, MACH, DSP, DTC DIGITAL EXCITER	1	
....2	550-123	Connector, 10 pin header (cut from 550-162)	1	J516
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
....2	919-0542-001	PCB, ASSY, ADAPTOR CS5397->CS5381	1	U1
.....3	007-1034-010	CAP,CER,0.01UF,10V,10%,0402	5	C1, C2, C3, C4, C5
.....3	104-0000	RES,CHIP,0 OHM JUMPER,0603,SMD	1	R1
.....3	104-1001	RES,CHIP,1.0 K OHM,1%,1/16W,0603,SMD	3	R2, R3, R4
.....3	216-5381	IC,AUDIO A/D,192KHZ,120DB,TSSOP-24	1	U1
.....3	519-0542-001	PCB, MACH, ADAPTOR CS5397->CS5381	1	PCB
.....3	979-0542-007	KIT,SOFTWARE, ADAPTOR MICRO, U7	1	U2
.....4	216-0202	IC, 8 BIT FLASH MICROCONTROLLERS, SMD, SOT-23-6	1	U2
.....4	579-0542-100	SOFTWARE, 919-0542-001 U2 MICRO	1	
....2	979-0542-U11	KIT, SW, XILINX U11	1	U11
.....3	224-1804	IC, PROM, XC18V00 SERIES, 44-PIN, PLCC	1	U11
....2	979-0542-U24	KIT, SW, DSP FM	1	U24
.....3	224-2901	IC,FLASH MEMORY,1 MBIT,3V ONLY,32 PIN PLCC	1	U24

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	979-0542-U38	KIT, SW, DSP MICRO	1	U38
.....3	224-8252	IC,MICROCONTROLLER 8 BIT WITH 8K BYTES FLASH,44 PIN PLCC	1	U38
....2	979-0542-U41	KIT,SW,XILINX,U41,V1.3,ANALOG ONLY	1	U41
.....3	224-1804	IC, PROM, XC18V00 SERIES, 44-PIN, PLCC	1	U41
..1	919-0543-100	PCB, ASSY, FXi FRONT PANEL CONTROL/SWITCH BD	1	
....2	020-4770	CAP,LYTIC,47UF,63V,STDUP	1	C1
....2	224-3295	TWO LAMP DC TO AC INVERTER SE23295 FOR LQ064V3DG01	1	U1
....2	334-0010	FUSE, 1A, AXIAL LEADS, FAST ACTING	1	F1
....2	340-0206	SWITCH, MOM, DPDT, CHROME CAP	11	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J1
....2	431-0440	CONN,4 PIN,HV,4MM RT ANGLE, SMD	1	
....2	519-0543-100	PCB, MACH, FXi FRONT PANEL CONTROL	1	
..1	919-0556	ASSY, PCB, CLOCK/FILTER, DTG DIGITAL EXCITER (SBCM)	1	
....2	007-1002	CAP, 1PF,50V SMD 0805	1	C142
....2	007-1012	CAP,CER,10pF,50V,2%,SMD	5	C117, C127, C128, C129, C130
....2	007-1022	CAP,CER,100pF,50V,2%,SMD	17	C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C90, C91, C92, C93, C94, C95
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	3	C96, C97, C98
....2	007-1034	CAP,CER,0.01uF,50V,10%,SMD	15	C15, C17, C21, C22, C23, C24, C25, C27, C28, C36, C39, C40, C46, C63, C136

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	25	C47, C50, C53, C54, C59, C67, C68, C69, C70, C71, C72, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C133, C134
....2	007-1512	CAP,CER,15pF,50V,2%,SMD	2	C121, C141
....2	007-2012	CAP,CER,20pF,50V,2%,SMD	1	C113
....2	007-2200	CAP,CER,2.2pF,50V,.25pF,SMD	3	C74, C75, C76
....2	007-3300	CAP,CER,3.3PF,50V,.25pF,SMD	4	C114, C115, C116, C140
....2	007-3312	CAP,CER,33pF,50V,2%,SMD	6	C4, C5, C6, C34, C37, C41
....2	007-4700-500	CAP,CER,4.7pF,50V,.25pF,SMD	2	C138, C139
....2	007-8200-500	CAP,CER,8.2pF,50V,.25pF,SMD	2	C119, C120
....2	014-1095	CAP, 1000 UF, 50V	1	C123
....2	070-1054	CAP,TANT,1uF,35V,10%,SMD	15	C13, C33, C44, C45, C48, C49, C51, C55, C58, C60, C64, C65, C66, C73, C132
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	5	C61, C62, C131, C135, C137
....2	070-1084	CAP,TANT,100uF,16V,10%,SMD	3	C124, C125, C126
....2	091-0315	CAP, TRIMMER, 3-15 PF, NPO, 50V, SMD	3	C77, C112, C118
....2	101-0150	Resistor,150 ohm 1/2W 5% SMD 2010	1	R4
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	1	R13
....2	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	5	R34, R35, R36, R37, R38
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	21	R28, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	18	R17, R20, R22, R27, R59, R60, R61, R62, R63, R64, R65, R66, R70, R73, R77, R84, R107, R108
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	22	R15, R16, R21, R24, R25, R26, R29, R30, R67, R68, R69, R71, R72, R74, R75, R76, R78, R79, R80, R81, R82, R83
....2	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	1	R104
....2	102-1825	RES,CHIP,18.2 K OHM,1/10W,1%	1	R23
....2	102-2000	RES,CHIP,200 OHM,1/10 W,1% SMD	4	R86, R87, R88, R89
....2	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	3	R9, R14, R90
....2	102-2430	RES,CHIP,243 OHMS,1/10W,1%,SMD, 0805	4	R10, R18, R19, R32
....2	102-3011	RES,CHIP,3.01K OHMS,1/10W,1%,SMD	2	R105, R106
....2	102-3321	RES,CHIP,3.32K OHMS,1/10W,1%,SMD	1	R31
....2	102-4991	RES,CHIP,49.9 OHMS,1/10W,1%,SMD	3	R91, R92, R93
....2	102-4993	RES,CHIP,499K OHMS,1/10W,1%,SMD	1	R85
....2	102-5110	RES,CHIP,511 OHMS,1/10W,1%,SMD	1	R102
....2	102-5143	RES,5.1K OHMS,1/10W,1%,SMD	8	R94, R95, R96, R97, R98, R100, R101, R103
....2	102-7150	RES,CHIP,715 OHMS,1/10W,1%,SMD	1	R33
....2	102-7501	RES,7.5K OHMS,1/10W,1%,SMD	1	R99
....2	105-0051	RES, CHIP, 51 OHM, 1W, 5%, 2512	1	R5
....2	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E (note)	1	R2
....2	204-3102	DIODE,MMBV3102LT1,SMD	9	D1, D2, D3, D7, D8, D9, D10, D11, D12
....2	210-0093	TRANSISTOR,BFR93A,SOT-23,SMD	7	Q1, Q2, Q3, Q4, Q5, Q6, Q7
....2	216-0310	TSTR,MMBFU310LT1,SMD	3	Q8, Q9, Q10

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	216-3904	TSTR,MMBT3904LT1,NPN,SMD	6	Q11, Q12, Q13, Q14, Q15, Q16
....2	221-0014	MMIC,EC-1078,20DBM,50 OHM (N)	1	U4
....2	221-0284	DUAL RAIL TO RAIL OP AMP 4 MHZ BW	2	U7, U11
....2	221-1105	MMIC,MSA-1105,17DBM,50 OHM	1	U2
....2	221-4110	RF PLL FREQUENCY SYNTHESIZER	1	U12
....2	224-0138	IC,74ACT138,3 TO 8 DECODER,SMD note	1	U10
....2	224-1180	IC,DUAL RS232 DRIVER/RECIEVER,18 PIN,S0-18	1	U8
....2	231-3170	VR,LM317,SMD	2	U5, U9
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	1	DS1
....2	340-0004	SW,JUMPER PROGRAMMABLE	3	P4, P6, P7
....2	350-025	INDUCTOR, 1.5 - 3 UH WITH SHIELD CAN #47271-021	4	L3, L5, L30, L35
....2	360-9160	INDUCTOR, VAR, 160 NH, 6%, SHIELDED	2	L4, L32
....2	366-0011	IND,10UH,SHIELDED,SMD	11	L8, L9, L10, L23, L25, L27, L31, L33, L34, L38, L49
....2	366-0014	INDUCTOR,0.82 uH,CHIP,SMD	7	L39, L40, L41, L42, L43, L44, L45
....2	366-0022-001	IND, 22 NH, AIR, 16 MM, 5%, SMD	2	L47, L48
....2	366-0028	IND,28NH,AIR,16MM,5%,SMD	1	L46
....2	366-0169	Air Core Inductor 169nH 12 Turns SMD	4	L2, L6, L29, L36
....2	366-0392	IND, 390 NH, SMD	1	L24
....2	366-0491	Air Core Inductor,491nH,2%,19 Turns,SMD	4	L1, L7, L28, L37
....2	390-0011	XTAL,32.768KHZ, WATCH TYPE	1	Y1
....2	417-0070	CONN,HEADER 4 PIN	1	J5
....2	417-0308	CONN,JACK,3-PIN,SMD	3	J4, J6, J7
....2	417-0903	RCPT, 9 PIN D, FEMALE	1	J8
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J3

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-1701	STRAIGHT JACK RECEPTACLE,SMB PCB MOUNT 50 OHM	4	J1, J2, J10, J11
....2	417-4004	CONN,HEADER,2 PIN	1	
....2	479-0175	SHIELD,1.5x1.75"x1.0",PC MOUNT"	3	
....2	479-0300	SHIELD,1.5x3.0"x1.0",PC MOUNT"	2	
....2	519-0556	PCB, MACH, CLOCK/FILTER, DTG DIGITAL EXCITER	1	
....2	979-0556-U6	KIT,SOFTWARE,MICRO,U6,CLOCK/FILTER	1	U6
.....3	220-0814	Microprocessor, ADuC814	1	U6
..1	919-0557	ASSY, PCB, FRONT PANEL LED, DTC DIGITAL EXCITER	1	
....2	323-9217	IND,LED,RED 521-9240	1	LED2
....2	323-9224	IND,LED,GRN,521-9270	1	LED1
....2	340-0004	SW,JUMPER PROGRAMMABLE	1	P1
....2	417-4004	CONN,HEADER,2 PIN	2	J2, J3
....2	418-0255	CONN,MALE,4PIN	1	J1
....2	441-0009	SPR,PHENOLIC 1/4RND X 1/2 #6	2	
....2	519-0557	PCB, MACH, FRONT PANEL LED, DTG DIGITAL EXCITER	1	
..1	949-0540	ASSY, WIRE HARNESS, DTC DIGITAL EXCITER (SBCM)	1	
....2	402-0051	TY-RAP, W/FLAG	22	
....2	410-0067	LUG,FEM DISCONNECT 22-18 .230W	2	
....2	417-0053	SKT,CONN 641294-1 AMP	4	
....2	417-0096	PLUG,POLARIZING	1	
....2	417-0123	HSNG,16 POS MOD IV 2-87499-9	1	
....2	417-0131	CONN,16 PIN 609-1630 ANSLEY	4	
....2	417-0148	HSNG,10 POS MOD 1V 1-87499-7	1	J2
....2	417-0224	KEYING PLUG MOD IV 87077 AMP	1	
....2	417-0372	CONTACT,CONN,FC112N2	7	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-0395	CONN, 3 PIN, FEMALE, CABLE CONNECTOR	3	
....2	417-0465	PIN, CRIMP, SUB-D CONN, 20-24 AWG	31	
....2	417-0466	SKT, CRIMP, SUB-D CONN, 20-24 AWG	32	
....2	417-2026	CONN, POLARIZED WIREMOUNT SOCKET, .100 PITCH"	1	
....2	417-3334	CONN, 60 PIN, RIBBON	2	
....2	417-3711	CONN SHELL,37-PIN D,MALE	1	
....2	417-3712	CONN SHELL, 37-PIN D, FEMALE	2	J1
....2	417-8766	CONTACT,CRIMP,MOD-IV 87809-1	25	
....2	418-0240	PLUG,FEM,4PIN	1	J9
....2	550-122	CONNECTOR, 10 PIN MOLEX HOUSING 09-50-8100	2	
....2	550-183	Connector, 3 pin Molex housing 09-50-8030	2	J5, J6
....2	550-327	Connector, Crimp Terminal Pin Molex 08-52-0112	22	
....2	600-0016	CBL,FLAT,16-COND,28GA	0.2	
....2	600-0016-001	CBL,FLAT,16-COND,28 GA,SHIELDED,JACKETED	2	
....2	601-1202	WIRE,AWG12 19/25 RED	2.01	
....2	601-1202-006	WIRE,AWG 12,STRANDED,LIGHT BLUE	2.3	
....2	601-1202-054	WIRE,AWG 12,STRANDED, GREEN/YELLOW	2.01	
....2	601-2209	WIRE,AWG22,7/30 WHT	107	
....2	602-2202	WIRE,TW,AWG22,PVC INS,BLK/RED	1.82	
....2	610-0007	CBL, 8 COND, #24 W/SHIELD	2.39	
....2	610-1184	CBL,60COND,28GA,ANSLEY	0.287	
....2	622-8451	WIRE,BELD 8451,SHIELD,1PR	2.1	
....2	690-0221	TUB,BLK HEAT SHRINK 3/4	0.1	
....2	693-0002	SLVG,1/4 EXPANDO FR BLACK"	1.35	
..1	949-0540-002	RF CABLES, FXi EXCITER VAR LO PWR ATTN (SBCM)	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-1702	RIGHT ANGLE CRIMP TYPE PLUG,SMB,50 OHM	6	
....2	417-1703	Straight Crimp Type Plug,SMB,50 ohm	1	
....2	417-8029	CONN,JACK,BULKHEAD,SMA,HEX CRIMP	1	
....2	417-8030	CONN,PLUG,RT ANG,SMA,HEX CRIMP	1	
....2	417-8031	CONN,PLUG,STRAIGHT,SMA,HEX CRIMP	1	
....2	418-0034	PLUG,BNC DUAL CRIMP 1-227079-6	2	
....2	621-1359	CBL,COAX,RG316/U,50 OHM	5.8	
..1	949-4263	VGA CABLE	1	
..1	959-0540	ASSY, DTC EXCITER POWER SUPPLY PANEL (SBCM)	1	
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	8	
....2	471-5331	PANEL,POWER SUPPLY,DTC EXCITER	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
....2	919-0540	ASSY, PCB, DTC EXCITER POWER SUPPLY (sbcm)	1	
.....3	006-1075	CAP,LYTIC,10uF,50V,20%,SMD note	7	C6, C40, C56, C84, C86, C96, C108
.....3	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	2	C163, C168
.....3	007-0683	CAP CERAMIC, 0.068uF, 50v, SMD, 0805	1	C30
.....3	007-1022	CAP,CER,100pF,50V,2%,SMD	2	C14, C136
.....3	007-1024	CAP,CER,.001uF,50V,10%,SMD	6	C34, C36, C52, C54, C117, C129
.....3	007-1034	CAP,CER,0.01uF,50V,10%,SMD	2	C57.C159

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	75	C2, C4, C5, C8, C9, C15, C20, C21, C24, C25, C28, C29, C32, C37, C38, C39, C50, C55, C61, C79, C82, C83, C87, C88, C89, C90, C91, C93, C94, C95, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C109, C110, C111, C112, C115, C119, C120, C123, C124, C125, C126, C127, C128, C135, C137, C143, C144, C1
.....3	007-1044-200	CAP, CHIP, .1UF, 200V, 20%, SMD	3	C3, C46, C134
.....3	007-1045	CAP,PPS,0.1UF,50V,1%,1913,SMD	1	C160
.....3	007-1054	CAP,CER,1uF,50V,10%,SMD	10	C11, C12, C92, C113, C114, C81, C161, C165, C166, C173
.....3	007-1203-500	CAP, CER, 1200 PF, 50V, 5%, SMD	1	C10
.....3	007-1512-500	CAP,CER,150pF,50V,2%,SMD	6	C60, C65, C73, C140, C141, C142
.....3	007-2202-100	CAP, 220pF, 100v, SMD	1	C69
.....3	007-2275-250	CAP,ELECTRO,22UF,20%,25V,SMD	3	C58, C80, C169
.....3	007-3312	CAP,CER,33pF,50V,2%,SMD	3	C33, C51, C158
.....3	007-3313	CAP,CER,330pF,50V,5%,SMD	1	C49
.....3	007-3314	CAP, CER, 3300PF, 50V, 5%, SMD	2	C31, C48
.....3	007-4724	CAP,CER,0.047uF,50V,10%,SMD	1	C13
.....3	007-4724-500	CAP,CER,.0047uF,50V,10%,SMD	1	C85
.....3	007-4744-050	CAP, CER, .47UF, 50V, -20% TO +80%	7	C16, C35, C53, C62, C66, C70, C74
.....3	007-6213-500	CAP,CER,620pF,50V,5%,SMD	1	C18
.....3	007-8201-050	CAP,CER,82 PFD,5%,50V,1206,SMD	1	C17



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	009-1023	CAP,CER CHIP,100PF,500V,5%	6	C43, C44, C121, C122, C132, C133
.....3	009-1033	CAP,CER CHIP,1000PF,500V,5%	1	C167
.....3	009-2723	CAP,CER CHIP,270PF,300V,5%	7	C41, C42, C59, C130, C131, C138, C139
.....3	013-0220	CAP,LYTIC,220uF,450v	1	C78
.....3	013-0470	CAP, LYTIC, 470UF, 450V	2	C19, C77
.....3	013-1095-001	CAP, 1000 UF, 25V	1	C23
.....3	020-1085	CAP,LYTIC,100UF,50V,STDUP,NP	1	C63
.....3	020-2273	CAP,LYTIC,22UF,35V,RADIAL	1	C118
.....3	020-3374	CAP,LYTIC,33UF,25V,NP	1	C171
.....3	020-4770	CAP,LYTIC,47UF,63V,STDUP	5	C22, C71, C72, C75, C76
.....3	020-4785	CAP,LYTIC,470UF,100V,20%,STDUP	3	C26, C45, C47
.....3	023-2273	CAP,LYTIC,220UF,50V,STDUP	1	C64
.....3	024-2274	CAP,LYTIC,22UF,100V,STDUP	2	C7, C27
.....3	024-4783	CAP,LYTIC,470UF,50V,STDUP	2	C67, C68
.....3	033-4763	CAP,POLY FILM,.47UF,600V,OVAL	2	C1, C116
.....3	100-1051	RES,10K OHM,1/4W,1%	2	R45, R46
.....3	101-3013	RES, 301K, 1/8W, 1%, SMD	5	R6, R7, R8, R30, R31
.....3	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	3	R16, R63, R66
.....3	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	12	R55, R74, R78, R88, R100, R114, R115, R118, R157, R158, R169, R204

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	30	R12, R13, R18, R25, R28, R41, R43, R53, R56, R80, R93, R95, R113, R123, R126, R127, R129, R134, R138, R142, R145, R149, R156, R174, R185, R193, R194, R195, R205, R207
.....3	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	23	R10, R17, R19, R21, R26, R58, R94, R96, R120, R119, R121, R141, R143, R144, R154, R171, R178, R184, R191, R197, R202, R203, R209
.....3	102-1004	RES,CHIP,1.00M OHMS,1/10W,1%,SMD	3	R42, R91, R187
.....3	102-1083	RES,CHIP,10M OHM,1/10 W,5%	3	R9, R170, R189
.....3	102-1102	RES,CHIP,11.0K OHMS,1/10W,1%,SMD	2	R140, R136
.....3	102-1136	RES,CHIP,113K OHM,1/10 W,1%	2	R135, R139
.....3	102-1186	RES, CHIP, 118K OHM, 1/10W, 1%	1	R208
.....3	102-1200	RES,CHIP,121 OHMS,1/10W,1%,SMD (NOTE)	5	R83, R85, R86, R87, R188
.....3	102-1331	RES,CHIP,1.33K OHMS,1/10W,1%,SMD	19	R22, R23, R79, R89, R90, R102, R132, R146, R155, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168
.....3	102-1432	RES, CHIP, 14.3K, 1/10W, 1%, SMD	1	R38
.....3	102-1500	RES,CHIP,150 OHMS,1/10W,1%,SMD	2	R101, R186
.....3	102-1501	RES,1.50K OHM,1/10W,1%	1	R37
.....3	102-1503	RES,CHIP,150K OHMS,1/10W,1%,SMD	2	R29, R2
.....3	102-1582	RES,CHIP,15.8 K, 1/10 W, 1%	1	R128
.....3	102-1825	RES,CHIP,18.2 K OHM,1/10W,1%	1	R35
.....3	102-1826	RES,CHIP,182K,1/10W,1%,SMD	1	R27
.....3	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	3	R71, R76, R206



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	4	R33, R72, R92, R196
.....3	102-2201	RES,CHIP,22.1 OHM,1/10W,1%	4	R24, R50, R62, R69
.....3	102-2216	RES,CHIP,221K OHM,1/10W,1%	1	R49
.....3	102-2341	RES,2.32K OHM,1/10W,1%	1	R112
.....3	102-2615	RES,26.1K OHM,1/10W,1%	1	R130
.....3	102-3160	RES,CHIP,3.16K OHMS,1/10W,1%,SMD	5	R34, R36, R116, R117, R153
.....3	102-3570	RES,CHIP,357 OHMS,1/10W,1%,SMD	1	R152
.....3	102-4022	RES,CHIP,40.2K OHMS,1/10W,1%,SMD	2	R148, R182
.....3	102-4321	RES,CHIP,4.32K OHMS,1/10W,1%,SMD	1	R70
.....3	102-4992	RES,49.9K OHMS,1/10W,1%,SMD	4	R44, R122, R124, R151
.....3	102-4993	RES,CHIP,499K OHMS,1/10W,1%,SMD	1	R15
.....3	102-5041	RES,4.99K OHM,1/10W,1%	2	R75, R77
.....3	102-5231	RES,5.23K OHM,1/10W,1%	1	R179
.....3	102-6191	RES, CHIP, 6.19K OHM, 1/10W, 1%	1	R57
.....3	102-6193	RES,CHIP,619 OHM,1/10W,1%	1	R173
.....3	102-6341	RES,CHIP,6.34K,1/10W,1%,SMD	1	R192
.....3	102-6982	RES,CHIP,69.8K,1/10W,1%,SMD	3	R133, R137, R14
.....3	102-7501	RES,7.5K OHMS,1/10W,1%,SMD	4	R20, R54, R73, R150
.....3	102-8454	RES,CHIP,8.45K OHM,1/10W,1%	3	R131, R125, R183
.....3	102-9094	RES,CHIP,9.09K OHM,1/10W,1%	2	R11, R147
.....3	102-9095	RES,90.9K OHM,1/10W,1%,SMD	1	R32
.....3	102-9101	RES CHIP 90.9 OHM 1/10W 1%	1	R82
.....3	103-1007	RES,1 MEG OHM,1/4W,1%,METAL	4	R39, R40, R47, R48
.....3	103-1584	RES,1.58K OHM,1/4W,1%,METAL	4	R51, R97, R98, R99
.....3	103-7503	RES,750 OHM,1/4W,1%,METAL	1	R52
.....3	110-5623	RES,56 OHM,1/2W,5%	2	R67, R68
.....3	110-8223	RES,82 OHM,1/2W,5%	1	R190

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	111-0002	.02 OHM 3W CURRENT SENSE RES, SMT	3	R3, R4, R5
.....3	120-1043	RES,1K OHM,1W,5%	1	R201
.....3	130-0100	RES, 250 VAC, 7A, FUSED	1	R1
.....3	130-1033-300	RES,100 OHM,3W,1%	2	R64, R65
.....3	130-1843	RES,1.8K OHM,2W,5%	2	R81, R198
.....3	130-2223	RES,22 OHM,2W,5%	2	R210, R211
.....3	130-2263	RES,220K OHM,2W,5%	6	R107, R108, R109, R175, R176, R177
.....3	130-3333	RES,330 OHM,2W,5%	2	R199, R200
.....3	140-0037	VARISTOR,V275LA40A	3	MOV1, MOV2, MOV3
.....3	140-0039	VARISTOR,V320LA40B	1	MOV4
.....3	200-1520	DIODE, 15A, 200V	4	D43, D44, D45, D46
.....3	200-1620	DIODE,FAST RECOVERY,16JPF20	1	D37
.....3	200-3030	DIODE, 300V, 30A, SWITCHING	1	D36
.....3	203-0360	DIODE,SCHOTTKY,3A,60V,MBR360	1	D24
.....3	203-5817	DIODE, 1N5817, 1A, 20V	2	D15, D64
.....3	203-5820	DIODE, 1N5820, 3A, 20V	1	D14
.....3	204-0037	DIODE,ZENER,7.5V,225mW,SMD	2	D16, D70
.....3	204-0040	DIODE,ZENER,12V,6%,1W,SMAZ12-13,SMD	2	D32, D42
.....3	204-0041	DIODE,ZENER,15V,225mW,SMD	2	D5, D72
.....3	204-0043	DIODE,ZENER,43V,225mW,SMD	1	D71
.....3	204-0336	DIODE,REFERENCE,2.5V,SMD	3	D23, D52, D53
.....3	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	38	D6, D7, D8, D12, D13, D20, D22, D30, D31, D41, D47, D48, D49, D50, D51, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D65, D66, D67, D68, D69, D78, D81, D82, D85, D86, D87, D88, D89



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	204-4005	DIODE, 1A, 600V, 4005, SMD	9	D17, D18, D26, D27, D28, D38, D39, D83, D84
.....3	206-0024	TRANSZORB DIODE, +/-24V, 1.5KE24CA	2	D74, D75
.....3	206-0300	TRANSZORB,300V ,SMD	3	D77, D79, D80
.....3	210-0520	HEXFET IRFI520G	2	Q6, Q26
.....3	210-1201	FET, SWITCHING, 1200VDC 8A, 2.1 OHMS RDS ON	1	Q10
.....3	210-5085	RF FET 85MOHM 500V	3	Q2, Q8, Q9
.....3	216-0113	IC, OPTO, HIGH SPEED	1	U11
.....3	216-0337	VR, LM337 NEGATIVE, SMD	1	U24
.....3	216-0339	IC,LM339AM,VOLTAGE COMPARATOR,SMD	4	U1, U20, U22, U23
.....3	216-0433	IC,OPTO PS2705-1,SMD	8	U13, U14, U15, U18, U19, U21, U25, U26
.....3	216-3825	IC, PWM, UC3825DW, SMD	2	U7, U10
.....3	216-3854	IC, PFC UC3854DW, SMD	1	U4
.....3	216-4081	IC,MC14081BD,QUAD 2-INPUT AND,SMD	1	U3
.....3	216-4093	IC,MC14093BD,QUAD 2-INPUT NAND,SMD	1	U16
.....3	216-4420	IC, DRIVER, TC4420, 6A	1	U9
.....3	216-4538	IC,MC14538BD DUAL MULTIVIBRATO,SMD	1	U29
.....3	216-7002	IC,MOSFET,2N7002LT1,SMD	23	Q1, Q3, Q4, Q5, Q7, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q27, Q28, Q29
.....3	220-4429	IC,DRIVER,MOSFET,TC4429CAT (N)	1	U12
.....3	227-0317	VR,LM317T,LM317KC	2	U17, U27
.....3	227-2576-012	VR, +12V FIXED VOLTAGE REGULATOR 3A, SWITCHER, LM2576HVT-12	1	U6
.....3	229-1750	TMP01FP TEMPERATURE SENSOR CHIP	1	U28
.....3	230-0013	RECT,FAST RECOVERY,FEN30JP	1	D25

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	230-0015	RECT,SILC,MR2406	4	D1, D2, D3, D4
.....3	230-0017	RECT,PWR SWITCHMOD MUR4100E	2	D34, D35
.....3	239-0001	BRDG RECT,FULL WAVE 2 AMP,200V	2	D19, D21
.....3	270-0066	REL,DPDT,12VDC,DIP	2	K4, K5
.....3	270-1213	REL,SPST,30A	3	K1, K2, K3
.....3	320-0011	LED,R.ANGLE PCB RED 5300E1 1D1	11	DS1, DS5, DS6, DS7, DS8, DS9, DS10, DS11, DS12, DS13, DS14
.....3	330-0004	FUSE,500MA,5X20MM,250V,SLO-BLO	2	F8, F10
.....3	330-0006	FUSE,1.5A,2014,FAST-ACTING	1	F6
.....3	330-0007	FUSE,4A,2014,FAST-ACTING	2	F4, F7
.....3	330-0009	FUSE,10A,2014,FAST-ACTING	1	F5
.....3	330-0800-001	FUSE,8A,250V,3AG,SLO-BLO	1	F9
.....3	330-1500-001	FUSE, 15A, 250V, CERAMIC, SLO-BLOW	2	F1, F2
.....3	334-1150	FUSE,5 X 20MM,1.5A,SLO-BLO	1	F3
.....3	340-0004	SW,JUMPER PROGRAMMABLE	2	P6, P7
.....3	360-0165	IND, .78 UH, 15A	2	L4, L6
.....3	360-0167	IND, .56 UH, 6A	3	L5, L7, L8
.....3	360-0170	IND, 100 UH, 14A	1	L3
.....3	360-5812	IND, POWER SUPPLY PFC	1	L1
.....4	375-5812	CORE, PS PFC INDUCTOR (NOTE)	2	
.....4	640-1800	WIRE AWG 18 EN MAGNET	0.044	
.....3	366-0331	IND, 330 UH, 1A RMS, SMD	1	L2
.....3	370-0064	XFMR, 48V SUPPLY, DTC EXCITER	1	T3
.....3	370-0065	XFMR FLYBACK SUPPLY DTC EXCITER	1	T4
.....3	370-0066	XFMR,DRIVE,POWER SUPPLY,DTC EXCITER	1	T6
.....3	370-0150	XFMR, CURRENT SENSE, 50:1	2	T2, T5
.....3	376-0257	XFMR, LOW VOLTAGE	1	T1



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	402-0015	TIE,CBL,PANDUIT, 7 3/8 LONG"	4	
.....3	409-0033	INSULATOR, TO247-2, 86/37 KERATHERM, .225MM THK.	3	
.....3	413-1206	CHIP,TEST POINT,1206,SMD	25	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25
.....3	415-2068	CLIP,FUSE,15AMP,LITTLEFUSE,102071	6	XF1, XF2, XF9
.....3	415-2069	CLIP,FUSE,LITTLEFUSE,111501	6	XF3, XF8, XF10
.....3	417-0044	CONN,10 PIN SINGLE ROW HEADER	2	J2, J8
.....3	417-0308	CONN,JACK,3-PIN,SMD	2	J6, J7
.....3	417-0398	CONN, MALE PCB MT	2	J1, J3
.....3	417-0804	SOCKET,8-PIN DIP,BURNDY	1	XU28
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D29, D33
.....3	420-4108	SCREW,4-40X.500,S.S. PH	3	
.....3	420-6104	SCREW,6-32X.250,S.S. PH	3	
.....3	420-6106	SCREW,6-32X.375,S.S. PH	4	
.....3	421-6001	6-32 S.S. HEX THIN NUT	4	
.....3	423-4001	#4 FLAT SS .250 X .125 X .018	3	
.....3	423-4002	#4 LOCK S.S. SPLIT	3	
.....3	423-6001	#6 FLAT .250 X .150 X .015	3	
.....3	423-6002	#6 LOCK SPLIT	10	
.....3	441-0012	STOFF,#6-32 MALE-FEMALE 1/4	3	
.....3	441-0215	SPACER, RESISTOR	2	
.....3	455-0037	HEATSINK,AAVID 530101B00150,PCB MNT W CLIP	4	XD36, XD37, XQ8, XQ9
.....3	455-0071	HEATSINK,CLIP-ON,PCB MT,TO-220	3	XU6, XD43, XD44

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	455-0075	HEATSINK,TO-220 PKG,.85 TALL	4	XD1, XD2, XD3, XD4
.....3	455-8000-001	HEATSINK,2 INCH,A" VERSION AM"	1	
.....3	519-0540	PCB, MACH, DTC EXCITER POWER SUPPLY	1	
.....3	550-123	Connector, 10 pin header (cut from 550-162)	1	J4
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
.....3	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	J5
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
.....3	601-1893	WIRE,AWG18,19/30,TFE INS,WHT	0.417	
.....3	611-0060	TUB, HT SHK, 1/16	0.17	
.....3	611-3750	TUB,HT SHK,3/8	0.083	
..1	959-0544	ASSY, POWER AMP, 60W,DTC DIGITAL EXCITER	1	
....2	130-5623	RES,560 OHM,2W,5%	1	R165
....2	131-5034	RES,50 OHM,250W,5%,ALN,FLANGE MT	2	R92, R93
....2	210-2918	TSTR, RF POWER, SD2918	3	Q9, Q10, Q11
....2	360-0150-001	COIL, 18AWG, 0.25 IN. DIA., 22T	1	
.....3	640-1800	WIRE AWG 18 EN MAGNET	0.03	
....2	360-0168	COIL,16GA,4.5T,50nH (SBCM)	3	L8, L12, L15
.....3	640-1600	WIRE,ENAMELED 16GA.	0.003	
....2	360-0169	COIL,14GA,2.5T,70nH (SBCM)	4	L16, L17, L18, L19
.....3	640-1400	WIRE,14GA,MAGNET	0.005	
....2	420-2107	SCREW,2-56X.437,S.S. PH SC	8	
....2	420-4106	SCREW,4-40X.375,S.S. PH	10	
....2	421-6908	SHEET EDGE CONNECTOR 6-32	3	
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	22	
....2	423-2002	#2 LOCK SPLIT	8	
....2	423-4002	#4 LOCK S.S. SPLIT	10	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	427-0061	CONNECTOR, N, PCB, STRAIGHT, PNL MTG	1	J7
....2	455-8012	HEATSINK,AMPLIFIER,DTC EXCITER	1	
....2	469-0000	FINGERSTOCK,CLIP-ON,LAIRD 97-973	6	
....2	469-0366	FINGER STOCK (NOTE!!!!)	14	
....2	471-5332	SHIELD,POWER AMPLIFIER,DTC EXCITER	1	
....2	471-5342	SPACER,90 DEGREE HYBRID,DTC EXCITER AMPLIFIER	2	
....2	471-5345	SHIELD, POWER AMPLIFIER, FXi60	1	
....2	471-5346	SHIELD, COIL, P.A., FXi60/250	1	
....2	519-0555	PCB, MACH, POWER AMP, SUB BOARD	1	
....2	565-0001	COUPLER, 3DB, 600W, 70-110 MHZ, PCB MT	2	HY1, HY2
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	919-0544	PCB, ASSY, POWER AMP, 60W DTC DIGITAL EXCITER (SBCM)NOTE!!!	1	
.....3	003-0105	CAP, CER, 1UF, 100V, 1812, 20%, SMD	2	C44, C50
.....3	006-1006	CAP,47 uF,Electrolytic,63V,SMD (NOTE)	4	C31, C37, C55, C62
.....3	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	3	C24, C46, C47
.....3	007-1012	CAP,CER,10pF,50V,2%,SMD	1	C26
.....3	007-1024	CAP,CER,.001uF,50V,10%,SMD	9	C19, C21, C25, C34, C45, C48, C72, C80, C98
.....3	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	22	C1, C5, C7, C14, C15, C16, C18, C20, C22, C23, C73, C74, C79, C81, C86, C84, C85, C87, C88, C90, C91, C92
.....3	007-1044-200	CAP, CHIP, .1UF, 200V, 20%, SMD	13	C2, C3, C4, C6, C8, C9, C10, C11, C12, C13, C93, C94, C95
.....3	007-1054	CAP,CER,1uF,50V,10%,SMD	1	C35
.....3	007-1054-001	CAP,CER,1UF,10%,10V,X7R,0805,SMD	4	C100, C101, C102, C103

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	007-1075-100	CAP, CER CHIP, 10 UF, 10V, 1206	1	C71
.....3	007-2202-500	CAP,CER,22pF,50V,2%,SMD	1	C78
.....3	007-2704-001	CAP, EMI FILTER, SMD	9	FL10, FL11, FL12, FL13, FL14, FL15, FL16, FL17, FL20
.....3	007-3312	CAP,CER,33pF,50V,2%,SMD	1	C76
.....3	009-1013	CAP,CER CHIP,10PF,500V,5%	3	C29, C96, C97
.....3	009-3313	CAP,33pF,PORCELAIN,500V,5%,SMD	5	C38, C58, C61, C66, C70
.....3	009-4723	CAP,CER CHIP,470PF,200V,5%	14	C27, C30, C32, C36, C39, C40, C43, C49, C53, C54, C59, C60, C65, C89
.....3	009-6210-001	CAP,CER CHIP,6.2PF,+/-0.1PF,500V (NOTE)	1	C28
.....3	009-6813	CAP,CER CHIP,68PF,500V,5%	4	C33, C67, C68, C69
.....3	009-8013	CAP,CER CHIP,82PF,500V,5%	2	C42, C51
.....3	020-4785	CAP,LYTIC,470UF,100V,20%,STDUP	2	C106, C107
.....3	070-1064	CAP,TANT,10uF,35V,20%,SMD	2	C82, C83
.....3	101-0150	Resistor,150 ohm 1/2W 5% SMD 2010	3	R97, R98, R99
.....3	102-0000	RES,CHIP,0 OHM,0805,SMD	17	R2, R3, R10, R11, R12, R13, R14, R15, R56, R66, R67, R77, R113, R115, R120, R163, R166
.....3	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	27	R4, R5, R22, R23, R24, R25, R26, R27, R31, R63, R64, R73, R82, R86, R87, R89, R90, R133, R154, R155, R156, R157, R158, R159, R160, R161, R162

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	27	R1, R32, R33, R36, R37, R38, R39, R40, R43, R45, R46, R49, R54, R55, R58, R60, R61, R62, R65, R108, R123, R127, R129, R131, R134, R146, R147
.....3	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	3	R7, R8, R9
.....3	102-1212	RES,CHIP,12.1K OHMS,1/10W,1%,SMD	2	R16, R21
.....3	102-1500	RES,CHIP,150 OHMS,1/10W,1%,SMD	1	R112
.....3	102-1510	RES, 15 OHM, 1/10W, 1%	12	R41, R51, R52, R53, R59, R70, R118, R124, R125, R126, R132, R151
.....3	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	8	R35, R42, R44, R47, R117, R128, R130, R150
.....3	102-2210	RES,CHIP,221 OHMS,1/10W,1%,SMD	3	R121, R122, R152
.....3	102-3010	RES, CHIP, 301 OHMS, 1/10W, 1%, SMD	5	R34, R71, R72, R116, R119
.....3	102-3012	RES,CHIP,30.1K,1/10W,1%,SMD	4	R17, R18, R19, R20
.....3	102-3650	RES,CHIP,36.5 OHMS,1/10W,1%,SMD	1	R111
.....3	102-4991	RES,CHIP,49.9 OHMS,1/10W,1%,SMD	1	R95
.....3	102-6409	RES,CHIP,64.9 OHMS,1/10W,1%,SMD	2	R48, R94
.....3	104-0101	RES,100OHM,1%,1/2W,2010,SMD	2	R101, R107
.....3	104-0301	RES, CHIP, 301 OHM, 1%, 1/2W, 2010, SMD	4	R96, R100, R104, R110
.....3	105-0001	RES, 1 OHM, 1%, 1/2W, SMD, 2010	1	R6
.....3	105-0010	RES, CHIP, 10 OHM, 1W, 1%, 2512	3	R103, R105, R164
.....3	105-0062	RES, CHIP, 62 OHM, 1W, 5%, 2512	2	R148, R149
.....3	105-0075-001	RES, CHIP, 75 OHM, 1%, 1/2W, 2010, SMD	1	R102
.....3	105-1010	RES, CHIP, 100 OHM, 1W, 5%, 2512, SMD	3	R78, R79, R80
.....3	111-0001	.01 OHM 2W CURRENT SENSE RES SMT	3	R28, R29, R30



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R74, R75, R76
.....3	198-0503	TRMR,50K,TOP ADJUST,SMD	2	R50, R57
.....3	198-2024	TRMR,2K OHMS,TOP ADJUST,10 TURN,SMD	4	R68, R83, R88, R153
.....3	201-2801	DIODE,HOT CARRIER,MMBD701LT1,SMD	3	D3, D11, D12
.....3	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	5	D1, D2, D5, D8, D10
.....3	210-0010	TSTR, MOSFET, 12A, 100V, N-CHANNEL, DPAK, SMT	1	Q12
.....3	210-1000	DIODE, ZENER, 10V, 225MW, SMD, SOT23	3	D6, D13, D14
.....3	210-1150	DIODE, ZENER, SMT, 15V, 3W, D0-214AA	3	D4, D7, D9
.....3	210-3310	P CHAN ENH MODE FET 60V SOT23	4	Q1, Q2, Q3, Q4
.....3	210-3906-001	TSTR,3906,SMD	1	Q6
.....3	210-5700	RF POWER TRANSISTOR, PD57002	1	Q8
.....3	216-3904	TSTR,MMBT3904LT1,NPN,SMD	2	Q5, Q7
.....3	220-0035	IC,LM35DZ CELSIUS TEMP SENSOR	1	U6
.....3	221-0074-S	IC,TL074 OP-AMP,QUAD,SMD	3	U1, U4, U8
.....3	221-0284	DUAL RAIL TO RAIL OP AMP 4 MHZ BW	2	U2, U3
.....3	221-8361	IC, TRUE AVERAGE POWER DETECTOR	1	U7
.....3	231-7805	VR,78L05AC,POS VOLT,100mA,SMD	1	U5
.....3	330-0060	FUSE, SMD, 1206, 1A, 63V	3	F3, F4, F5
.....3	330-0061	FUSE, SMD, 15A, 65V	2	F1, F2
.....3	339-0301	ATTENUATOR, 3DB, SMT, 10W	2	ATT1, ATT2
.....3	350-188	INDUCTOR, 1210 1uH CHIP	4	L1, L7, L10, L11
.....3	350-203	IND, SMT, 1812, 33 NH	2	L22, L23
.....3	366-0027-001	INDUCTOR, SMD, AIR CORE, 27 NH	1	L6
.....3	366-0100	IND,100NH LAMINATED CER,0805,SMD	2	L20, L21
.....3	366-0126	INDUCTOR,SMD,AIR CORE,11T,130nH	1	L5
.....3	366-0127	INDUCTOR,SMD,AIR CORE,20T,538nH	1	L3



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	366-0128	INDUCTOR,SMD,AIR CORE,100nH	1	L2
.....3	366-0130	INDUCTOR,POWER,SMD,1uH,10A	4	L4, L9, L13, L14
.....3	366-6152	FERRITE,CHIP IMPEDANCE 1500OHMS @ 100MHZ MULTILAYER, 0805	8	FL1, FL2, FL3, FL4, FL5, FL6, FL7, FL8
.....3	407-0500	EMI SHIELD, MODIFIED 50KE-CBSAFN-.75x1.5x.50	1	
.....3	407-0501	EMI SHIELD, MODIFIED 50KE-CBSAFN-2.5x3.25x.50	1	
.....3	417-0214	CONN,HEADER 20 PIN R.ANGLE	1	J1
.....3	417-0265	CONN,BNC,JACK,THREADED,PC EDGE MOUNT,LOW PROFILE	1	J4
.....3	417-0398	CONN, MALE PCB MT	1	J3
.....3	417-0701	CONN,SMA FEMALE PC MOUNT	2	J2, J6
.....3	447-0024	COUPLER, WIRELINE, 26 dB	2	W1, W2
.....3	519-0544	PCB, MACH, POWER AMP, 60W DTC DIGITAL EXCITER	1	
.....3	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	J5
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
.....3	700-0168-001	CONFORMAL COATING, ACRYLIC, BULK	0.001	
.....3	809-0180	JUMPER, COAX, SEMI-RIGID, 1.8 IN	1	W4
.....3	809-0350	JUMPER, COAX, SEMI-RIGID, 3.5 IN	1	W3
..1	979-0540	KIT, INSTALLATION, DTC DIGITAL EXCITER	1	
....2	417-0291	CONN,PLUG,25-PIN,D",SOLDER CUPS"	1	
....2	417-0910	KIT,BACKSHELL FOR 9-PIN D CONN	1	
....2	417-2510	KIT,BACKSHELL FOR 25PIN D CONN	1	
....2	417-3288	ADAPTER,BNC-JACK TO N-PLUG,50 OHM(N	1	
....2	420-0007	SCREW,12-24 X 3/4,NATURAL SST,TRUSS HD, PHILLIPS DRIVE"	4	
....2	420-0710	SCR,10-32 X 5/8,NATURAL SST,TRUSS HD,PHILLIPS DRIVE"	4	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	421-0002	12-24 SPEED NUT (NOTE)	4	
....2	550-111	CONNECTOR, D-SUB 9 PIN FEMALE	1	
....2	682-0001	CORD LINE,3 COND,DETACH 7.5FT	1	
....2	682-0003	CORD,PWR EUROPEAN RIGHT ANGLE, 6'	1	
....2	701-0007	ANTISTATIC ZIPLOC BAG 12X12	1	
....2	804-5002	NULL MODEM ADAPTOR DB9F TO DB9F	1	
....2	829-4217	PLUG,MALE XLR, A3M (XLR-3-12C)	3	
....2	849-0902	CBL ASSY,COMPUTER,DB9-DB9,M/F,6FT	1	
..1	979-0541	KIT, BINDER AND MANUAL, DTC DIGITAL EXCITER	1	
....2	597-0541	INSTRUCTION MANUAL, FXI 60/250, FM DIGITAL EXCITER	1	
.....3	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	1	
....2	598-0008	BINDER,2 IN, BLUE W CD POCKET (NOTE)	1	

6.2 FXi 250 EXCITER

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	909-9250	FXi-250, FM DTC 250W DIGITAL EXCITER		
..1	380-5502	FILTER,FAN	1	
..1	380-8250	FAN,DC GALAXY,24V,15W,150CFM	1	
..1	400-0600	STRIP,QUIET SHIELD,6.00x.197	6	
..1	400-6700	GROMMET STRIP,.062-.090	0.125	
..1	402-0000	TY-RAP	8	
..1	402-0001	TY-RAP,T+B TY24M,1-1/4 DIA	2	
..1	402-0006	MT,ADH BACKED,FOR CBL TIES	2	
..1	402-0008	MTG DEVICE,FOR #6SCR,TIE CBL	4	
..1	410-0100-100	DISPLAY,COLOR LCD,FLAT PANEL,DTC DIGITAL EXCITER	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	417-3713	CONN,37-PIN/SOCKET ADAPTOR,1000PF C,FILTERED	1	
..1	417-5145-811	MODULE, IEC, AC SW/CB, FILT, 15A, 110/220	1	
..1	420-0508	SCREW,10-32X.500,S.S. FLH	1	
..1	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	5	
..1	420-4103	SCREW,4-40X.187,S.S. PH	4	
..1	420-4105	SCREW,4-40X.312,S.S. PH	18	
..1	420-4204	SCREW,4-40X.250,PH FLH UC	6	
..1	420-6002	SCREW,6-32X.437,S.S. PH FH UC	27	
..1	420-6514	SCREW,6-32X.875,S.S. PH FH	4	
..1	421-0102	10-32 KEP NUT	1	
..1	421-1003	1/4-20 HEX NUT	1	
..1	421-1113	RIV,CLOSED-END .125 X .316L	4	
..1	421-4008	4-40 KEP NUT	6	
..1	421-6008	6-32 KEP NUT	4	
..1	421-6908	SHEET EDGE CONNECTOR 6-32	30	
..1	421-8028	NUT,JAM,1/2-28 UNEF-2B	5	
..1	422-6106	SCREW,SEMS 6-32 X 3/8 PAN PH. ST."	9	
..1	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	63	
..1	423-1003	1/4-20 LOCK SPLIT	1	
..1	423-4002	#4 LOCK S.S. SPLIT	20	
..1	423-6006	#6 FLAT, 0.75 O.D, 0.140 I.D., 0.062 THK, SST	2	
..1	423-9002	WASH,INT TOOTH,1/2	5	
..1	469-0366	FINGER STOCK (NOTE!!!!!!)	14	
..1	469-0366-2	STRIP,RFI SHIELD 4.25	1	
....2	469-0366	FINGER STOCK (NOTE!!!!!!)	4.25	
..1	471-5326-100	PANEL,FRONT,FXi EXCITER WITH NEW DISPLAY	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	471-5327	CHASSIS,DTC EXCITER	1	
..1	471-5328	PARTITION,FAN,DTC EXCITER	1	
..1	471-5329	SHIELD,POWER SUPPLY,DTC EXCITER	1	
..1	471-5330-100	PANEL,REAR,DTC EXCITER	1	
..1	471-5333	ANGLE,FRONT PANEL MOUNT,DTC EXCITER	1	
..1	471-5334	COVER,TOP,DTC EXCITER	1	
..1	471-5363	FILLER,DAUGHTER CARD,PLAIN.FXi60/250	1	
..1	471-5367	FILLER,OPTIONS,BLANK,FXi60/250	1	
..1	500-033	Screw, 6 x 1/4 phillips head SM SS type A"	1	
..1	500-210	Screw,SEMS 4-40x1/4 Phil Pan Head MS Blk Zinc(external lock)	4	
..1	591-0034	NAMEPLATE,FXi250,DTC EXCITER	1	
..1	591-0036	LABEL,POWER,DTC EXCITER	1	
..1	591-0037	LABEL,FAULT,DTC EXCITER	1	
..1	594-0073	LABEL,WARNING ROTATING FANS	2	
..1	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
..1	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
..1	700-0148	TAPE,JOINING 3/4	0.001	
..1	919-0142	PCB,ASSY,ATTENUATOR,VAR,LO PWR,PNL MTG	1	
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	1	R4
....2	102-3320	RES,CHIP,332 OHMS,1/10W,1%,SMD	2	R2, R3
....2	177-1044	RES,TRMR,1K,25TURN,TOP ADJ	1	R1
....2	417-0259	CONN, BNC PCB MOUNT	2	J1, J2
....2	519-0142	PCB,MACH,ATTENUATOR,VAR,LO PWR,PNL MTG	1	
..1	919-0541-001	PCB, ASSY, CONTROLLER (SBCM)	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1022	CAP,CER,100pF,50V,2%,SMD	11	C68, C69, C70, C71, C72, C73, C74, C75, C101, C102, C103
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	5	C5, C6, C7, C8, C22
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	69	C1, C2, C3, C4, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C42, C43, C44, C47, C48, C49, C50, C51, C52, C54, C55, C56, C57, C59, C60, C61, C63, C64, C76, C77, C78, C79, C80, C81, C82, C83, C88, C89, C91, C92, C93, C94, C95, C96
....2	007-1054	CAP,CER,1uF,50V,10%,SMD	10	C37, C38, C39, C40, C41, C45, C53, C58, C62, C90
....2	007-3923	CAP,CER,390pF,100V,5%,SMD	1	C46
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	7	C65, C66, C67, C84, C85, C86, C87
....2	070-1065	CAP,TANT,10UF,20V,10%,SMD	8	C104, C105, C106, C107, C108, C109, C110, C111
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	8	R23, R24, R27, R28, R39, R41, R43, R101
....2	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	5	R36, R47, R48, R49, R50
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	1	R37
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	1	R57
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	18	R1, R2, R3, R31, R32, R35, R42, R46, R51, R60, R63, R66, R69, R80, R81, R84, R88, R92

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1501	RES,1.50K OHM,1/10W,1%	1	R22
....2	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	11	R59, R62, R65, R68, R71, R73, R75, R77, R79, R86, R89
....2	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	2	R45, R53
....2	102-2201	RES,CHIP,22.1 OHM,1/10W,1%	10	R4, R5, R6, R7, R8, R9, R10, R11, R15, R17
....2	102-2210	RES,CHIP,221 OHMS,1/10W,1%,SMD	2	R54, R58
....2	102-2431	RES,CHIP,2.43K OHMS,1/10W,1%,SMD	1	R33
....2	102-2743	RES,CHIP,274 OHM,1/10W,1%,SMD	2	R13, R14
....2	102-3302	RES,CHIP,33.2 OHMS,1/10W,1%,SMD	2	R25, R26
....2	102-3304	RES,CHIP,3.3M,1/10W,10%,SMD	11	R61, R64, R67, R70, R72, R74, R76, R78, R85, R87, R90
....2	102-3832	RES, CHIP, 38.3 KOHMS, 1/10W, 1%, SMD	3	R82, R83, R91
....2	102-4421	RES,CHIP,4.42K OHMS,1/10W,1%,SMD	1	R29
....2	102-5041	RES,4.99K OHM,1/10W,1%	1	R30
....2	102-5143	RES,5.1K OHMS,1/10W,1%,SMD	4	R12, R16, R52, R100
....2	102-9311	RES,9.31K OHMS,1/10W,1%,SMD	1	R34
....2	198-1054	TRMR,10K OHMS,TOP ADJ,SMD (N)	2	R40, R44
....2	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	2	D1, D2
....2	210-3906-001	TSTR,3906,SMD	2	Q1, Q4
....2	216-0074	IC,TL074CD,QUAD OP AMP,SMD	3	U27, U28, U29
....2	216-0301	MOSFET,NCH,25V,LO VTH,SOT23	1	Q3
....2	216-7002	IC,MOSFET,2N7002LT1,SMD	2	Q2, Q5
....2	224-0011	IC, USB TRANSCEIVER, LV, SMD	1	U15
....2	224-0116	IC, 16 MEG SDRAM, SMD	2	U13, U14
....2	224-0160	IC, PAGE FLASH, 16 MEG, SMD (NOTE D.N.S.)	1	U12
....2	224-0708	IC, MICRO SUPERVISOR, 3V, SMD	1	U4



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	224-0905	IC, CLOCK BUFFER,LV, SMD	1	U5
....2	224-2210	IC, PAL, 22LV10, LOW V, SMD	3	U17, U18, U20
....2	224-2410	IC,RS-232 MULTI-TRANSCEIVER,+5V,SMD	1	U16
....2	224-3806	IC, LCD DISPLAY CONTROL, SMD	1	U37
....2	224-5272	IC, MICROPROCESSOR, MCF5272	1	U1
....2	224-6245	IC, 16 BIT TRANSCEIVER, SMD	4	U7, U8, U9, U21
....2	224-6373	IC, 16 BIT LATCH, LV, SMD	4	U30, U31, U32, U40
....2	224-7225	IC,QUAD D/A,8 BIT,TLC7225	1	U26
....2	224-7548	IC, D/A CONVERTER, 12 BIT, PLCC	1	U22
....2	224-7733	IC, POWER SUPERVISOR, 3.3V	1	U3
....2	226-4740	RES NET,4.7K,10-PIN,.1 SPACE	7	R18, R19, R20, R21, R38, R55, R56
....2	227-1585	VR,LT1585CT-3.3,3.3V,TO-220	1	U38
....2	229-0033	IC,OPTOIS,4N33	5	U24A, U35A, U35B, U36A, U36B
....2	229-0111	IC,AC INPUT OPTO-ISOLATOR	6	U19A, U19B, U33A, U33B, U34A, U34B
....2	229-0158	IC,A/D AND MUX,SMD	2	U23, U25
....2	229-9366-001	IC,CMOS SERIAL EEPROM,4K,93C66	1	U6
....2	231-0136	IC,VOLT REF,2.5V,8-PIN SOIC	1	D3
....2	231-7905	VR,LM79L05AC,NEG VOLT,100mA,SMD	1	U39
....2	270-1254	REL,12V 2PDT	1	K1
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	2	DS1, DS2
....2	340-0004	SW,JUMPER PROGRAMMABLE	7	P8, P14, P15, P16, P17, P20, P24
....2	342-3304	SW,TACT,SPST,N.O.,SMD,RECESSED	2	S1, S2
....2	390-4800	OSCILLATOR, 48.00 MHZ	1	U11
....2	390-6600	OSCILLATOR, 66.00 MHZ	1	U10
....2	408-6000	CONNECTOR, HEADER, 60 PIN, SMD	1	J5
....2	413-0106	TERM,TEST POINT,OVAL,RED	2	TP1, TP2

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-0189	CONN,9PIN MALE,RTANG,PCB MT	1	J10
....2	417-0200	CONN,HEADER 20 PIN	1.5	J8, J9, J11, J13, J14, J15, J16, J17, J20, J24
....2	417-0315	CONN,USB TYPE B" RECEPTACLE, PCB MOUNT"	1	J12
....2	417-0677	CONN,PCB MT,6PIN MALE	1	J7
....2	417-1128	CONNECTOR HEADER, 28 PIN, 2MM	1	J22
....2	417-1132	CONNECTOR HEADER, 32 PIN,2MM	1	J21
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J6
....2	417-8925	CONN, 25 PIN,D, FEMALE, R.A. FILTERED	1	J3
....2	418-0255	CONN,MALE,4PIN	1	J25
....2	418-2602	CONN,PCB MALE HEADER,26 POS	1	J1
....2	418-2602-001	CONN,HEADER,26 PIN,LATCH/EJECT,PCB	1	J23
....2	420-4106	SCREW,4-40X.375,S.S. PH	2	
....2	421-4008	4-40 KEP NUT	2	
....2	431-1400	SOCKET,14-PIN,DIP,SMD	6	U19A, U19B, U24A, U33A, U33B, U34A, U34B, U35A, U35B, U36A, U36B
....2	431-1600	SOCKET,16-PIN,DIP,SMD note	1	XK1
....2	519-0541-001	PCB, MACH, CONTROLLER	1	
..1	919-0542	PCB, ASSY, DSP, DTC DIGITAL EXCITER (SBCM)	1	
....2	006-1075	CAP,LYTIC,10uF,50V,20%,SMD note	13	C604, C605, C606, C607, C608, C609, C611, C613, C614, C615, C616, C686, C693
....2	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	1	C681
....2	006-1085	CAP,ELECTRO,100 UF,10%,35V,SMD	4	C641, C648, C655, C662
....2	006-4775-350	CAP,ELECTRO,47UF,20%,35V,SMD	3	C610, C612, C685



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-0010	CHIP CERAMIC 10pF 50V 5% 0603 SMD	4	C255, C256, C257, C258
....2	007-0330	CAP,CER,.33UF,+80,-20%,16V,0603,SMD	4	C26, C45, C56, C206
....2	007-0560	Chip Ceremac, 560pF 50v 5% 1206 SMD	1	C243
....2	007-0683	CAP CERAMIC, 0.068uF, 50v, SMD, 0805	1	C506
....2	007-1012	CAP,CER,10pF,50V,2%,SMD	3	C617, C671, C672
....2	007-1013-050	CAP,CER,100 PFD,5%,50V,0603,SMD	2	C269, C270
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	5	C522, C675, C676, C677, C678
....2	007-1034	CAP,CER,0.01uF,50V,10%,SMD	27	C3, C502, C503, C504, C505, C525, C526, C531, C532, C541, C542, C556, C557, C558, C592, C593, C619, C629, C630, C620, C665, C667, C669, C687, C688, C689, C690
....2	007-1040-025	CAP,CER,.1UF,+80,-20%,25V,0603,SMD	131	C1, C2, C15, C16, C17, C24, C25, C30, C31, C35, C36, C37, C38, C39, C40, C48, C49, C50, C51, C52, C53, C54, C55, C57, C58, C59, C61, C62, C63, C66, C74, C75, C76, C78, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C104, C105, C106, C107, C108,

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	56	C18, C501, C507, C509, C511, C513, C515, C519, C520, C537, C539, C543, C544, C545, C546, C547, C548, C549, C551, C552, C553, C554, C555, C559, C560, C561, C562, C563, C564, C568, C569, C570, C577, C579, C580, C583, C584, C587, C589, C595, C598, C599, C600, C601, C602, C603, C622, C624, C626, C635, C642,
....2	007-1054	CAP,CER,1uF,50V,10%,SMD	8	C638, C640, C645, C647, C652, C654, C659, C661
....2	007-1054-002	CAP,CER,1000PF,+80,-20%,50V,0603,SMD	4	C125, C236, C238, C272
....2	007-1201-050	CAP,CER,12 PFD,5%,50V,1206,SMD	3	C291, C292, C523
....2	007-1512	CAP,CER,15pF,50V,2%,SMD	1	C571
....2	007-1800-006	CAP,1800pF,50V,10%,SMD,0603	1	C597
....2	007-2202-051	CAP,CER,22PF,5%,50V,0603,SMD	2	C218, C220
....2	007-2705	CAP,CER,.027UF,10%,50V,1206,SMD	2	C239, C240
....2	007-3300	CAP,CER,3.3PF,50V,.25pF,SMD	2	C528, C529
....2	007-3913-050	CAP,CER,39 PF,5%,50V,1206,SMD	4	C130, C131, C132, C133
....2	007-3923	CAP,CER,390pF,100V,5%,SMD	8	C517, C518, C637, C644, C651, C658, C673, C674
....2	007-4700-501	CAP,CER,4.7NF,10%,50V,0603,SMD	5	C208, C209, C210, C211, C254
....2	007-4724	CAP,CER,0.047uF,50V,10%,SMD	1	C253
....2	007-6800-501	CAP,CER,6.8nF,10%,50V,0603,SMD	1	C250
....2	007-6812-001	CAP,CER,68PF,5%,50V,0603,SMD	2	C214, C215



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	009-0200	CAP,TANTALUM CHIP,10UF,POLAR,10%,25V,SMD	7	C7, C8, C11, C12, C13, C14, C249
....2	009-0201	CAP,TANTALUM CHIP,10UF,POLAR,10%,10V	18	C19, C20, C21, C22, C23, C27, C33, C34, C41, C42, C44, C46, C207, C212, C213, C260, C261, C682
....2	009-0202	CAP,TANALUM CHIP,100UF,POLAR,10%,6V,SMD	1	C67
....2	009-0204	CAP,TANTALUM CHIP,47UF,POLAR,10%,6V,SMD	2	C231, C232
....2	009-0206	CAP,TANTALUM CHIP,15UF,POLAR,10%,10V,SMD	1	C60
....2	020-1085	CAP,LYTIC,100UF,50V,STDUP,NP	6	C508, C510, C514, C516, C679, C680
....2	020-3385	CAP,LYTIC,330UF,25V,NP	3	C521, C540, C578
....2	070-0220	Cap,Tantalum Chip 220uF 10V 10% 7343H SMD	2	C68, C332
....2	070-1054	CAP,TANT,1uF,35V,10%,SMD	14	C538, C576, C581, C582, C585, C586, C588, C590, C618, C621, C623, C625, C627, C670
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	22	C524, C527, C530, C533, C535, C536, C565, C566, C567, C572, C573, C591, C594, C628, C631, C632, C633, C634, C663, C664, C691, C692
....2	070-1084-L16	CAP,TANT,100 MFD,20%,16V,E CASE,LOW ESR,SMD	4	C636, C643, C650, C657
....2	070-2265-L25	CAP,TANT,22 MFD,20%,25V, E CASE,LOW ESR,SMD	4	C639, C646, C653, C660
....2	101-0150	Resistor,150 ohm 1/2W 5% SMD 2010	1	R661
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	5	R600, R623, R703, R915, R916

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	13	R137, R505, R506, R507, R508, R513, R514, R515, R516, R523, R524, R525, R526
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	48	R190, R191, R192, R555, R556, R557, R558, R559, R560, R561, R562, R564, R566, R570, R575, R577, R579, R581, R583, R585, R586, R587, R588, R589, R590, R592, R593, R595, R596, R602, R603, R604, R605, R609, R610, R635, R636, R641, R642, R648, R649, R655, R656, R677, R678, R701, R627, R629
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	43	R503, R511, R519, R520, R521, R529, R530, R533, R534, R535, R536, R537, R538, R544, R545, R546, R547, R548, R549, R551, R552, R553, R554, R597, R599, R626, R632, R638, R643, R645, R650, R652, R657, R662, R663, R668, R669, R670, R671, R692, R693, R694, R695
....2	102-1004	RES,CHIP,1.00M OHMS,1/10W,1%,SMD	6	R509, R510, R517, R518, R527, R528
....2	102-1063	RES,CHIP,100K OHMS,1/10W,5%,SMD	3	R531, R532, R700
....2	102-1133	RES,CHIP,110 OHMS,1/10W,1%,SMD	1	R501
....2	102-1200	RES,CHIP,121 OHMS,1/10W,1%,SMD (NOTE)	2	R612, R616
....2	102-1214	RES, CHIP, 1.21K OHM, 1/10W, 1%	2	R136, R653



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1582	RES,CHIP,15.8 K, 1/10 W, 1%	7	R624, R625, R631, R633, R637, R644, R651
....2	102-1691	RES,CHIP,1.69K OHMS,1/10W,1%,SMD	1	R543
....2	102-1780	RES,CHIP,178 OHMS,1/10W,1%,SMD	1	R914
....2	102-2430	RES,CHIP,243 OHMS,1/10W,1%,SMD, 0805	2	R674, R676
....2	102-2431	RES,CHIP,2.43K OHMS,1/10W,1%,SMD	1	R646
....2	102-2741	RES,CHIP,2.74K OHMS,1/10W,1%,SMD	2	R628, R630
....2	102-3011	RES,CHIP,3.01K OHMS,1/10W,1%,SMD	18	R563, R565, R567, R568, R569, R571, R572, R573, R574, R576, R578, R580, R582, R584, R594, R606, R620, R622
....2	102-3160	RES,CHIP,3.16K OHMS,1/10W,1%,SMD	7	R539, R540, R541, R542, R613, R617, R696
....2	102-3653	RES,CHIP,365 OHM,1/10W,1%	5	R611, R614, R615, R618, R697
....2	102-4750	RES,CHIP,475 OHMS,1/10W,1%,SMD	1	R502
....2	102-5041	RES,4.99K OHM,1/10W,1%	6	R634, R640, R647, R654, R672, R673
....2	102-5112	RES,CHIP,51.1 OHM,1/10W,1%	3	R522, R621, R666
....2	102-8164	RES, CHIP, 8.66K OHM, 1/10W, 1% ,CR21-8661F-T	1	R639
....2	102-8251	RES,8.25K OHMS,1/10W,1%,SMD	1	R598
....2	104-0000	RES,CHIP,0 OHM JUMPER,0603,SMD	7	R99, R100, R102, R123, R195, R681, R682
....2	104-0010	RES,CHIP,10.0 OHM,1%,1/16W,0603,SMD	3	R26, R95, R212
....2	104-0022	RES,CHIP,22.1 OHM,1%,1/16W,0603,SMD	14	R21, R23, R24, R25, R32, R35, R42, R43, R76, R81, R82, R89, R90, R91
....2	104-0049	RES,CHIP,49.9 OHM,1%,1/16W,0603,SMD	5	R8, R9, R10, R130, R239

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-0100	RES,CHIP,100 OHM,1%,0.10W,0603,SMD	9	R29, R83, R84, R85, R86, R187, R188, R189, R208
....2	104-0220	RESISTOR,221ohm,1/16W,SMD,0603	1	R92
....2	104-0392	RES,CHIP,392 OHMS,1%,1/16W,0603,SMD	1	R16
....2	104-0634	RES,CHIP,634 OHMS,1%,1/10W,0805,SMD	2	R504, R512
....2	104-1001	RES,CHIP,1.0 K OHM,1%,1/16W,0603,SMD	58	R11, R12, R13, R14, R15, R47, R48, R52, R53, R54, R55, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R79, R103, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R126, R133, R134, R145, R164, R172, R175, R659, R660, R689, R6
....2	104-1002	RES,CHIP,10.0 K OHM,1%,1/16W,0603,SMD	3	R87, R88, R101
....2	104-1500	RES,CHIP,1.5 KOHM,1%,1/16W,0603,SMD	2	R122, R128
....2	104-2200	RES,CHIP,2.21KOHM,1%,1/16W,0603,SMD	4	R19, R20, R104, R129
....2	104-2201	RES,CHIP,22.1Kohm,1%,1/16W,0603,SMD	4	R77, R78, R165, R166
....2	104-3301	RES,CHIP,3.32Kohm,1%,1/16W,0603,SMD	2	R201, R203
....2	104-3320-001	RES,CHIP,332 OHM,1%,1/16W,0603,SMD	3	R18, R132, R225
....2	104-4700	RES,CHIP,475 OHM,1%,1/16W,0603,SMD	4	R160, R161, R162, R163
....2	104-4701	RES,CHIP,4.75KOHM,1%,1/16W,0603,SMD	16	R5, R22, R27, R40, R41, R44, R45, R46, R49, R50, R51, R56, R96, R147, R238, R690
....2	104-4702	RES,CHIP,47.5Kohm,1%,1/16W,0603,SMD	2	R131, R186



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-6000	RES,604 OHM,1%,1/16W,0603,SMD	3	R93, R94, R124
....2	104-6004	RES,60.4 OHM,1%,1/16W,0603,SMD	1	R169
....2	104-6810	RES,CHIP,681 OHM,1%,1/16W,0603,SMD	2	R2, R17
....2	104-8200	Chip Res, 8.25K 1% 1/16W 0603 SMD	1	R204
....2	105-1010	RES, CHIP, 100 OHM, 1W, 5%, 2512, SMD	1	R913
....2	198-5034	TRMR,500 OHMS,TOP ADJUST,SMD	1	R608
....2	201-0012-001	TRANSIENT VOLTAGE SUPPRESSION DIODE, 10v	11	D503, D504, D505, D506, D507, D508, D509, D510, D511, D512, D513
....2	204-0130	SCHOTTKY BARRIER RECTIFIER 1 AMP 30V CASE 403A SMD	4	D518, D520, D522, D524
....2	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	12	D26, D27, D501, D502, D514, D515, D516, D517, D519, D521, D523, D525
....2	204-2800	DIODE,SCHOTTKY,HSMS-2800,SOT-23	1	D28
....2	210-0093	TRANSISTOR,BFR93A,SOT-23,SMD	3	Q509, Q510, Q511
....2	216-3800	IC, OP AMP,QUAD, SINGLE SUPPLY RAIL TO RAIL I/O, SO-14	1	U29
....2	216-3801	IC, DUAL RF FREQUENCY SYNTHESIZER, TSSOP-20	1	U30
....2	216-3904	TSTR,MMBT3904LT1,NPN,SMD	3	Q506, Q507, Q508
....2	216-4071	IC,MC14071BD,QUAD 2-INPUT OR,SMD	1	U502
....2	216-4227	IC,OPA4227UA,QUAD OP AMP,SO-14,SMD	4	U3, U4, U5, U6
....2	216-7002	IC,MOSFET,2N7002LT1,SMD	8	Q501, Q502, Q503, Q504, Q505, Q512, Q513, Q515
....2	216-7400	IC,SN74AHCT1G00DBV,2-INPUT POS NAND,DBV,SMD	4	U13, U505, U508, U527
....2	220-4052-002	IC,4052 DUAL 4-CH MUX,SMD	2	U506, U507
....2	221-1105	MMIC,MSA-1105,17DBM,50 OHM	1	U526
....2	221-2134-001	RAIL TO RAIL I/O OPAMP DUAL SO8	2	U503, U528

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	224-0138	IC,74ACT138,3 TO 8 DECODER,SMD note	2	U515, U516
....2	224-0708	IC, MICRO SUPERVISOR, 3V, SMD	1	U39
....2	224-1180	IC,DUAL RS232 DRIVER/RECIEVER,18 PIN,S0-18	1	U37
....2	224-1808	DIGITAL POTENTIOMETER, DS1808Z-050	3	U509, U512, U513
....2	224-1852	IC, DAC, STERIO, 24 BIT, 192KHZ, 28 PIN, SSOP	1	U10
....2	224-1896	IC,SAMPLE RATE CONVERTER,STEREO,ASYNCH,192 KHZ,28 PIN,SSOP	1	U18
....2	224-2227	IC,LOW NOISE OP AMP,8 PIN,S0-8	1	U9
....2	224-3200	IC,STEREO AUDIO CODEC,24 BIT,96KHZ,28 PIN DB,SSOP	1	U21
....2	224-4456	IC, FPGA, VIRTEX-II 1.5V,456-PIN, BGA	2	U8, U14
....2	224-6711	IC,FLOATING POINT DSP,150MHZ,256 PIN,BGA (NOTE D.N.S.)	1	U22
....2	224-8138	IC,DIFFERENTIAL ADC DRIVER,8 PIN,SO-8	1	U2
....2	224-8414	IC, 96 KHZ DIGITAL AUDIO RECEIVER	1	U501
....2	224-9260	IC,ADC W/16 BIT RESOLUTION,2.5MHZ WORD RATE,44 PIN,MQFP	1	U1
....2	224-9772	IC, AD9772A, 14-BIT DAC, 48-LEAD LQFP	1	U12
....2	226-1000	Res Network, 1K,8 pin, SMD	1	RN1
....2	226-4701	Res Network, 4.7K ohm, 8 pin, SMD	2	RN2, RN3
....2	226-4744	RES NET,4.7K,1%,1.13W,9 PIN SIP	1	RP1
....2	227-0317	VR,LM317T,LM317KC	2	U517, U529
....2	227-0337	VOLTAGE REGULATOR,3 TERM, NEG	2	U519, U520
....2	227-1085	VR, LT1085IT, 3A, LOW DROPOUT, TO-220	1	U521
....2	227-1576	VR, LT1576IS8, SWITCHER, 1.5A, SMD	4	U522, U523, U524, U525
....2	270-0065	REL,SPDT,12VDC,DIP	1	K503
....2	270-0065-001	REL,SPDT,12VDC,HIGH ISOLATION,DIP	1	K504
....2	270-0066	REL,DPDT,12VDC,DIP	2	K501, K502



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	270-222-001	CAP,CER,2200PF,10%,50V,0603,SMD	1	C222
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	4	DS501, DS502, DS503, DS504
....2	339-0102	CAP, 1000pF, 50V, 20%, 2706	2	FL508, FL509
....2	339-0222	FILTER,EMI,2200PF,SMD	6	FL503, FL504, FL505, FL506, FL507, FL510
....2	340-0004	SW,JUMPER PROGRAMMABLE	9	P4, P12, P19, P27, P30, P506, P509, P515, P529
....2	350-197	INDUCTOR, SMT, POWER, 1uH	8	L511, L513, L514, L516, L517, L519, L520, L522
....2	360-0125-001	Inductor 68uH SMD	4	L512, L515, L518, L521
....2	360-0165	IND, .78 UH, 15A	1	L505
....2	360-0167	IND, .56 UH, 6A	6	L504, L506, L507, L508, L509, L524
....2	366-0011	IND,10UH,SHIELDED,SMD	3	L502, L503, L523
....2	366-0014	INDUCTOR,0.82 uH,CHIP,SMD	1	L525
....2	366-0015-001	IND,1.5 UH,10%,1210,SMD	2	L29, L30
....2	366-2204	IND,22 uH,10%,LQH3C220K04,1210,SMD	5	L1, L9, L20, L13, L14
....2	366-4724	IND,4.7 uH,10%,LQH1N4R7K04M00,1206,SMD	4	L25, L26, L27, L28
....2	367-9370	XFMR,SMT,AES/EBU,SC937-02	1	T501
....2	375-0020	TRANSFORMER, RF, 1:1, 0.3-200MHZ, SM-22 PACKAGE	3	T1, T2, T502
....2	390-0062	CRYSTAL, 12MHZ, +/-50 PPM TOLERANCE, SMD	1	Y6
....2	390-1115	OSC,XTAL,10.000MHZ,MODEL T-1115	1	Y501
....2	390-3072	OSC, VCXO,30.72 MHZ	1	U27
....2	390-6144	CRYSTAL, 6.144MHz, 50PPM, CLOCK OSCILLATOR	1	Y502

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	401-275	IC,SMT,OP-AMP,LOW NOISE,HIGH AUDIO BW	3	U504, U510, U511
....2	408-6000	CONNECTOR, HEADER, 60 PIN, SMD	1	J505
....2	413-0603	Chip,Test Point 0603 SMD	192	TP1, TP2, TP3, TP4, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP19, TP20, TP21, TP22, TP42, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP50, TP51, TP52, TP53, TP54, TP55, TP56, TP58, TP59, TP60, TP61, TP62, TP65, TP66, TP67, TP68, TP69, TP70, TP71, TP72, TP73, TP75, TP76, TP78, TP
....2	417-0265	CONN,BNC,JACK,THREADED,PC EDGE MOUNT,LOW PROFILE	4	J512, J514, J518, J520
....2	417-0266	CONN,BNC,JACK,PC EDGE MOUNT,LOW PROFILE	1	J513
....2	417-0308	CONN,JACK,3-PIN,SMD	6	J4, J506, J509, J515, J529, JP30
....2	417-0506	6 pin single row header .1 center	4	JP3, JP4, JP31, JP32
....2	417-0512	12 pin header	1	JP13
....2	417-0903	RCPT, 9 PIN D, FEMALE	1	J9
....2	417-1093-001	CONN,RECP,DB-9,FILTERED,RT.ANGLE,4-40,PCB MT	1	J519
....2	417-1603	CONN,HEADER 16-PIN,DUAL 8-PIN	12	JP5, JP6, JP7, JP8, JP9, JP10, JP11, JP12, JP14, JP15, JP16, JP26
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	JP526
....2	417-1701	STRAIGHT JACK RECEPTACLE,SMB PCB MOUNT 50 OHM	4	J2, J3, J527, J510
....2	417-4004	CONN,HEADER,2 PIN	1	JP19



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-6013	MODULE,FIBRE OPTIC RECIEVER,TORX173	1	J504
....2	418-0051	CONN,AUDIO PC 3 PIN FEM E3FRAB	3	J501, J502, J503
....2	418-0902	CONN, SOCKET,80 POSITION,DOUBLE ROW, .8MM,SMD	1	J507
....2	431-1400	SOCKET,14-PIN,DIP,SMD	2	XK503, XK504
....2	431-1600	SOCKET,16-PIN,DIP,SMD note	2	XK501, XK502
....2	431-3200	SOCKET,32-PIN,PLCC,SMD note	2	XK24, XK25
....2	431-4400	SOCKET,44-PIN,PLCC,SMD note	3	XK11, XK38, XK41
....2	455-0037	HEATSINK,AAVID 530101B00150,PCB MNT W CLIP	1	XU521
....2	455-0071	HEATSINK,CLIP-ON,PCB MT,TO-220	4	XU517, XU519, XU520, XU527
....2	519-0542	PCB, MACH, DSP, DTC DIGITAL EXCITER	1	
....2	550-123	Connector, 10 pin header (cut from 550-162)	1	J516
.....3	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
....2	919-0542-001	PCB, ASSY, ADAPTOR CS5397->CS5381	1	U1
.....3	007-1034-010	CAP,CER,0.01UF,10V,10%,0402	5	C1, C2, C3, C4, C5
.....3	104-0000	RES,CHIP,0 OHM JUMPER,0603,SMD	1	R1
.....3	104-1001	RES,CHIP,1.0 K OHM,1%,1/16W,0603,SMD	3	R2, R3, R4
.....3	216-5381	IC,AUDIO A/D,192KHZ,120DB,TSSOP-24	1	U1
.....3	519-0542-001	PCB, MACH, ADAPTOR CS5397->CS5381	1	PCB
.....3	979-0542-007	KIT,SOFTWARE, ADAPTOR MICRO, U7	1	U2
.....4	216-0202	IC, 8 BIT FLASH MICROCONTROLLERS, SMD, SOT-23-6	1	U2
.....4	579-0542-100	SOFTWARE, 919-0542-001 U2 MICRO	1	
....2	979-0542-U11	KIT, SW, XILINX U11	1	U11
.....3	224-1804	IC, PROM, XC18V00 SERIES, 44-PIN, PLCC	1	U11
....2	979-0542-U24	KIT, SW, DSP FM	1	U24
.....3	224-2901	IC,FLASH MEMORY,1 MBIT,3V ONLY,32 PIN PLCC	1	U24

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	979-0542-U38	KIT, SW, DSP MICRO	1	U38
.....3	224-8252	IC,MICROCONTROLLER 8 BIT WITH 8K BYTES FLASH,44 PIN PLCC	1	U38
....2	979-0542-U41	KIT,SW,XILINX,U41,V1.3,ANALOG ONLY	1	U41
.....3	224-1804	IC, PROM, XC18V00 SERIES, 44-PIN, PLCC	1	U41
..1	919-0543-100	PCB, ASSY, FXi FRONT PANEL CONTROL/SWITCH BD	1	
....2	020-4770	CAP,LYTIC,47UF,63V,STDUP	1	C1
....2	224-3295	TWO LAMP DC TO AC INVERTER SE23295 FOR LQ064V3DG01	1	U1
....2	334-0010	FUSE, 1A, AXIAL LEADS, FAST ACTING	1	F1
....2	340-0206	SWITCH, MOM, DPDT, CHROME CAP	11	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J1
....2	431-0440	CONN,4 PIN,HV,4MM RT ANGLE, SMD	1	
....2	519-0543-100	PCB, MACH, FXi FRONT PANEL CONTROL	1	
..1	919-0556	ASSY, PCB, CLOCK/FILTER, DTG DIGITAL EXCITER (SBCM)	1	
....2	007-1002	CAP, 1PF,50V SMD 0805	1	C142
....2	007-1012	CAP,CER,10pF,50V,2%,SMD	5	C117, C127, C128, C129, C130
....2	007-1022	CAP,CER,100pF,50V,2%,SMD	17	C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C90, C91, C92, C93, C94, C95
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	3	C96, C97, C98
....2	007-1034	CAP,CER,0.01uF,50V,10%,SMD	15	C15, C17, C21, C22, C23, C24, C25, C27, C28, C36, C39, C40, C46, C63, C136

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	25	C47, C50, C53, C54, C59, C67, C68, C69, C70, C71, C72, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C133, C134
....2	007-1512	CAP,CER,15pF,50V,2%,SMD	2	C121, C141
....2	007-2012	CAP,CER,20pF,50V,2%,SMD	1	C113
....2	007-2200	CAP,CER,2.2pF,50V,.25pF,SMD	3	C74, C75, C76
....2	007-3300	CAP,CER,3.3PF,50V,.25pF,SMD	4	C114, C115, C116, C140
....2	007-3312	CAP,CER,33pF,50V,2%,SMD	6	C4, C5, C6, C34, C37, C41
....2	007-4700-500	CAP,CER,4.7pF,50V,.25pF,SMD	2	C138, C139
....2	007-8200-500	CAP,CER,8.2pF,50V,.25pF,SMD	2	C119, C120
....2	014-1095	CAP, 1000 UF, 50V	1	C123
....2	070-1054	CAP,TANT,1uF,35V,10%,SMD	15	C13, C33, C44, C45, C48, C49, C51, C55, C58, C60, C64, C65, C66, C73, C132
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	5	C61, C62, C131, C135, C137
....2	070-1084	CAP,TANT,100uF,16V,10%,SMD	3	C124, C125, C126
....2	091-0315	CAP, TRIMMER, 3-15 PF, NPO, 50V, SMD	3	C77, C112, C118
....2	101-0150	Resistor,150 ohm 1/2W 5% SMD 2010	1	R4
....2	102-0000	RES,CHIP,0 OHM,0805,SMD	1	R13
....2	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	5	R34, R35, R36, R37, R38
....2	102-1000	RES,CHIP,100 OHMS,1/10W,1%,SMD	21	R28, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	18	R17, R20, R22, R27, R59, R60, R61, R62, R63, R64, R65, R66, R70, R73, R77, R84, R107, R108
....2	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	22	R15, R16, R21, R24, R25, R26, R29, R30, R67, R68, R69, R71, R72, R74, R75, R76, R78, R79, R80, R81, R82, R83
....2	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	1	R104
....2	102-1825	RES,CHIP,18.2 K OHM,1/10W,1%	1	R23
....2	102-2000	RES,CHIP,200 OHM,1/10 W,1% SMD	4	R86, R87, R88, R89
....2	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	3	R9, R14, R90
....2	102-2430	RES,CHIP,243 OHMS,1/10W,1%,SMD, 0805	4	R10, R18, R19, R32
....2	102-3011	RES,CHIP,3.01K OHMS,1/10W,1%,SMD	2	R105, R106
....2	102-3321	RES,CHIP,3.32K OHMS,1/10W,1%,SMD	1	R31
....2	102-4991	RES,CHIP,49.9 OHMS,1/10W,1%,SMD	3	R91, R92, R93
....2	102-4993	RES,CHIP,499K OHMS,1/10W,1%,SMD	1	R85
....2	102-5110	RES,CHIP,511 OHMS,1/10W,1%,SMD	1	R102
....2	102-5143	RES,5.1K OHMS,1/10W,1%,SMD	8	R94, R95, R96, R97, R98, R100, R101, R103
....2	102-7150	RES,CHIP,715 OHMS,1/10W,1%,SMD	1	R33
....2	102-7501	RES,7.5K OHMS,1/10W,1%,SMD	1	R99
....2	105-0051	RES, CHIP, 51 OHM, 1W, 5%, 2512	1	R5
....2	108-502	Potentiometer, 5K ohms, SMT, Bourns 3224W-1-502E (note)	1	R2
....2	204-3102	DIODE,MMBV3102LT1,SMD	9	D1, D2, D3, D7, D8, D9, D10, D11, D12
....2	210-0093	TRANSISTOR,BFR93A,SOT-23,SMD	7	Q1, Q2, Q3, Q4, Q5, Q6, Q7
....2	216-0310	TSTR,MMBFU310LT1,SMD	3	Q8, Q9, Q10



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	216-3904	TSTR,MMBT3904LT1,NPN,SMD	6	Q11, Q12, Q13, Q14, Q15, Q16
....2	221-0014	MMIC,EC-1078,20DBM,50 OHM (N)	1	U4
....2	221-0284	DUAL RAIL TO RAIL OP AMP 4 MHZ BW	2	U7, U11
....2	221-1105	MMIC,MSA-1105,17DBM,50 OHM	1	U2
....2	221-4110	RF PLL FREQUENCY SYNTHESIZER	1	U12
....2	224-0138	IC,74ACT138,3 TO 8 DECODER,SMD note	1	U10
....2	224-1180	IC,DUAL RS232 DRIVER/RECIEVER,18 PIN,S0-18	1	U8
....2	231-3170	VR,LM317,SMD	2	U5, U9
....2	325-0250	LED,DUAL RED/GREEN,LOW PROFILE,SMD	1	DS1
....2	340-0004	SW,JUMPER PROGRAMMABLE	3	P4, P6, P7
....2	350-025	INDUCTOR, 1.5 - 3 UH WITH SHIELD CAN #47271-021	4	L3, L5, L30, L35
....2	360-9160	INDUCTOR, VAR, 160 NH, 6%, SHIELDED	2	L4, L32
....2	366-0011	IND,10UH,SHIELDED,SMD	11	L8, L9, L10, L23, L25, L27, L31, L33, L34, L38, L49
....2	366-0014	INDUCTOR,0.82 uH,CHIP,SMD	7	L39, L40, L41, L42, L43, L44, L45
....2	366-0022-001	IND, 22 NH, AIR, 16 MM, 5%, SMD	2	L47, L48
....2	366-0028	IND,28NH,AIR,16MM,5%,SMD	1	L46
....2	366-0169	Air Core Inductor 169nH 12 Turns SMD	4	L2, L6, L29, L36
....2	366-0392	IND, 390 NH, SMD	1	L24
....2	366-0491	Air Core Inductor,491nH,2%,19 Turns,SMD	4	L1, L7, L28, L37
....2	390-0011	XTAL,32.768KHZ, WATCH TYPE	1	Y1
....2	417-0070	CONN,HEADER 4 PIN	1	J5
....2	417-0308	CONN,JACK,3-PIN,SMD	3	J4, J6, J7
....2	417-0903	RCPT, 9 PIN D, FEMALE	1	J8
....2	417-1606	CONN,HEADER,16-PIN,PCB MOUNT	1	J3

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-1701	STRAIGHT JACK RECEPTACLE,SMB PCB MOUNT 50 OHM	4	J1, J2, J10, J11
....2	417-4004	CONN,HEADER,2 PIN	1	
....2	479-0175	SHIELD,1.5x1.75"x1.0",PC MOUNT"	3	
....2	479-0300	SHIELD,1.5x3.0"x1.0",PC MOUNT"	2	
....2	519-0556	PCB, MACH, CLOCK/FILTER, DTG DIGITAL EXCITER	1	
....2	979-0556-U6	KIT,SOFTWARE,MICRO,U6,CLOCK/FILTER	1	U6
.....3	220-0814	Microprocessor, ADuC814	1	U6
..1	919-0557	ASSY, PCB, FRONT PANEL LED, DTC DIGITAL EXCITER	1	
....2	323-9217	IND,LED,RED 521-9240	1	LED2
....2	323-9224	IND,LED,GRN,521-9270	1	LED1
....2	340-0004	SW,JUMPER PROGRAMMABLE	1	P1
....2	417-4004	CONN,HEADER,2 PIN	2	J2, J3
....2	418-0255	CONN,MALE,4PIN	1	J1
....2	441-0009	SPR,PHENOLIC 1/4RND X 1/2 #6	2	
....2	519-0557	PCB, MACH, FRONT PANEL LED, DTG DIGITAL EXCITER	1	
..1	949-0540	ASSY, WIRE HARNESS, DTC DIGITAL EXCITER (SBCM)	1	
....2	402-0051	TY-RAP, W/FLAG	22	
....2	410-0067	LUG,FEM DISCONNECT 22-18 .230W	2	
....2	417-0053	SKT,CONN 641294-1 AMP	4	
....2	417-0096	PLUG,POLARIZING	1	
....2	417-0123	HSNG,16 POS MOD IV 2-87499-9	1	
....2	417-0131	CONN,16 PIN 609-1630 ANSLEY	4	
....2	417-0148	HSNG,10 POS MOD 1V 1-87499-7	1	J2
....2	417-0224	KEYING PLUG MOD IV 87077 AMP	1	
....2	417-0372	CONTACT,CONN,FC112N2	7	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-0395	CONN, 3 PIN, FEMALE, CABLE CONNECTOR	3	
....2	417-0465	PIN, CRIMP, SUB-D CONN, 20-24 AWG	31	
....2	417-0466	SKT, CRIMP, SUB-D CONN, 20-24 AWG	32	
....2	417-2026	CONN, POLARIZED WIREMOUNT SOCKET, .100 PITCH"	1	
....2	417-3334	CONN, 60 PIN, RIBBON	2	
....2	417-3711	CONN SHELL,37-PIN D,MALE	1	
....2	417-3712	CONN SHELL, 37-PIN D, FEMALE	2	J1
....2	417-8766	CONTACT,CRIMP,MOD-IV 87809-1	25	
....2	418-0240	PLUG,FEM,4PIN	1	J9
....2	550-122	CONNECTOR, 10 PIN MOLEX HOUSING 09-50-8100	2	
....2	550-183	Connector, 3 pin Molex housing 09-50-8030	2	J5, J6
....2	550-327	Connector, Crimp Terminal Pin Molex 08-52-0112	22	
....2	600-0016	CBL,FLAT,16-COND,28GA	0.2	
....2	600-0016-001	CBL,FLAT,16-COND,28 GA,SHIELDED,JACKETED	2	
....2	601-1202	WIRE,AWG12 19/25 RED	2.01	
....2	601-1202-006	WIRE,AWG 12,STRANDED,LIGHT BLUE	2.3	
....2	601-1202-054	WIRE,AWG 12,STRANDED, GREEN/YELLOW	2.01	
....2	601-2209	WIRE,AWG22,7/30 WHT	107	
....2	602-2202	WIRE,TW,AWG22,PVC INS,BLK/RED	1.82	
....2	610-0007	CBL, 8 COND, #24 W/SHIELD	2.39	
....2	610-1184	CBL,60COND,28GA,ANSLEY	0.287	
....2	622-8451	WIRE,BELD 8451,SHIELD,1PR	2.1	
....2	690-0221	TUB,BLK HEAT SHRINK 3/4	0.1	
....2	693-0002	SLVG,1/4 EXPANDO FR BLACK"	1.35	
..1	949-0540-002	RF CABLES, FXi EXCITER VAR LO PWR ATTN (SBCM)	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	417-1702	RIGHT ANGLE CRIMP TYPE PLUG,SMB,50 OHM	6	
....2	417-1703	Straight Crimp Type Plug,SMB,50 ohm	1	
....2	417-8029	CONN,JACK,BULKHEAD,SMA,HEX CRIMP	1	
....2	417-8030	CONN,PLUG,RT ANG,SMA,HEX CRIMP	1	
....2	417-8031	CONN,PLUG,STRAIGHT,SMA,HEX CRIMP	1	
....2	418-0034	PLUG,BNC DUAL CRIMP 1-227079-6	2	
....2	621-1359	CBL,COAX,RG316/U,50 OHM	5.8	
..1	949-4263	VGA CABLE	1	
..1	959-0540	ASSY, DTC EXCITER POWER SUPPLY PANEL (SBCM)	1	
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	8	
....2	471-5331	PANEL,POWER SUPPLY,DTC EXCITER	1	
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	594-0505	LABEL, WARNING-ONLY AUTHORIZED PERSONNEL	1	
....2	919-0540	ASSY, PCB, DTC EXCITER POWER SUPPLY (sbcm)	1	
.....3	006-1075	CAP,LYTIC,10uF,50V,20%,SMD note	7	C6, C40, C56, C84, C86, C96, C108
.....3	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	2	C163, C168
.....3	007-0683	CAP CERAMIC, 0.068uF, 50v, SMD, 0805	1	C30
.....3	007-1022	CAP,CER,100pF,50V,2%,SMD	2	C14, C136
.....3	007-1024	CAP,CER,.001uF,50V,10%,SMD	6	C34, C36, C52, C54, C117, C129
.....3	007-1034	CAP,CER,0.01uF,50V,10%,SMD	2	C57.C159



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	75	C2, C4, C5, C8, C9, C15, C20, C21, C24, C25, C28, C29, C32, C37, C38, C39, C50, C55, C61, C79, C82, C83, C87, C88, C89, C90, C91, C93, C94, C95, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C109, C110, C111, C112, C115, C119, C120, C123, C124, C125, C126, C127, C128, C135, C137, C143, C144, C1
.....3	007-1044-200	CAP, CHIP, .1UF, 200V, 20%, SMD	3	C3, C46, C134
.....3	007-1045	CAP,PPS,0.1UF,50V,1%,1913,SMD	1	C160
.....3	007-1054	CAP,CER,1uF,50V,10%,SMD	10	C11, C12, C92, C113, C114, C81, C161, C165, C166, C173
.....3	007-1203-500	CAP, CER, 1200 PF, 50V, 5%, SMD	1	C10
.....3	007-1512-500	CAP,CER,150pF,50V,2%,SMD	6	C60, C65, C73, C140, C141, C142
.....3	007-2202-100	CAP, 220pF, 100v, SMD	1	C69
.....3	007-2275-250	CAP,ELECTRO,22UF,20%,25V,SMD	3	C58, C80, C169
.....3	007-3312	CAP,CER,33pF,50V,2%,SMD	3	C33, C51, C158
.....3	007-3313	CAP,CER,330pF,50V,5%,SMD	1	C49
.....3	007-3314	CAP, CER, 3300PF, 50V, 5%, SMD	2	C31, C48
.....3	007-4724	CAP,CER,0.047uF,50V,10%,SMD	1	C13
.....3	007-4724-500	CAP,CER,.0047uF,50V,10%,SMD	1	C85
.....3	007-4744-050	CAP, CER, .47UF, 50V, -20% TO +80%	7	C16, C35, C53, C62, C66, C70, C74
.....3	007-6213-500	CAP,CER,620pF,50V,5%,SMD	1	C18
.....3	007-8201-050	CAP,CER,82 PFD,5%,50V,1206,SMD	1	C17

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	009-1023	CAP,CER CHIP,100PF,500V,5%	6	C43, C44, C121, C122, C132, C133
.....3	009-1033	CAP,CER CHIP,1000PF,500V,5%	1	C167
.....3	009-2723	CAP,CER CHIP,270PF,300V,5%	7	C41, C42, C59, C130, C131, C138, C139
.....3	013-0220	CAP,LYTIC,220uF,450v	1	C78
.....3	013-0470	CAP, LYTIC, 470UF, 450V	2	C19, C77
.....3	013-1095-001	CAP, 1000 UF, 25V	1	C23
.....3	020-1085	CAP,LYTIC,100UF,50V,STDUP,NP	1	C63
.....3	020-2273	CAP,LYTIC,22UF,35V,RADIAL	1	C118
.....3	020-3374	CAP,LYTIC,33UF,25V,NP	1	C171
.....3	020-4770	CAP,LYTIC,47UF,63V,STDUP	5	C22, C71, C72, C75, C76
.....3	020-4785	CAP,LYTIC,470UF,100V,20%,STDUP	3	C26, C45, C47
.....3	023-2273	CAP,LYTIC,220UF,50V,STDUP	1	C64
.....3	024-2274	CAP,LYTIC,22UF,100V,STDUP	2	C7, C27
.....3	024-4783	CAP,LYTIC,470UF,50V,STDUP	2	C67, C68
.....3	033-4763	CAP,POLY FILM,.47UF,600V,OVAL	2	C1, C116
.....3	100-1051	RES,10K OHM,1/4W,1%	2	R45, R46
.....3	101-3013	RES, 301K, 1/8W, 1%, SMD	5	R6, R7, R8, R30, R31
.....3	102-0100	RES,CHIP,10.0 OHMS,1/10W,1%,SMD	3	R16, R63, R66
.....3	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	12	R55, R74, R78, R88, R100, R114, R115, R118, R157, R158, R169, R204

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	30	R12, R13, R18, R25, R28, R41, R43, R53, R56, R80, R93, R95, R113, R123, R126, R127, R129, R134, R138, R142, R145, R149, R156, R174, R185, R193, R194, R195, R205, R207
.....3	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	23	R10, R17, R19, R21, R26, R58, R94, R96, R120, R119, R121, R141, R143, R144, R154, R171, R178, R184, R191, R197, R202, R203, R209
.....3	102-1004	RES,CHIP,1.00M OHMS,1/10W,1%,SMD	3	R42, R91, R187
.....3	102-1083	RES,CHIP,10M OHM,1/10 W,5%	3	R9, R170, R189
.....3	102-1102	RES,CHIP,11.0K OHMS,1/10W,1%,SMD	2	R140, R136
.....3	102-1136	RES,CHIP,113K OHM,1/10 W,1%	2	R135, R139
.....3	102-1186	RES, CHIP, 118K OHM, 1/10W, 1%	1	R208
.....3	102-1200	RES,CHIP,121 OHMS,1/10W,1%,SMD (NOTE)	5	R83, R85, R86, R87, R188
.....3	102-1331	RES,CHIP,1.33K OHMS,1/10W,1%,SMD	19	R22, R23, R79, R89, R90, R102, R132, R146, R155, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168
.....3	102-1432	RES, CHIP, 14.3K, 1/10W, 1%, SMD	1	R38
.....3	102-1500	RES,CHIP,150 OHMS,1/10W,1%,SMD	2	R101, R186
.....3	102-1501	RES,1.50K OHM,1/10W,1%	1	R37
.....3	102-1503	RES,CHIP,150K OHMS,1/10W,1%,SMD	2	R29, R2
.....3	102-1582	RES,CHIP,15.8 K, 1/10 W, 1%	1	R128
.....3	102-1825	RES,CHIP,18.2 K OHM,1/10W,1%	1	R35
.....3	102-1826	RES,CHIP,182K,1/10W,1%,SMD	1	R27
.....3	102-2001	RES,CHIP,2.00K OHMS,1/10W,1%,SMD	3	R71, R76, R206



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	4	R33, R72, R92, R196
.....3	102-2201	RES,CHIP,22.1 OHM,1/10W,1%	4	R24, R50, R62, R69
.....3	102-2216	RES,CHIP,221K OHM,1/10W,1%	1	R49
.....3	102-2341	RES,2.32K OHM,1/10W,1%	1	R112
.....3	102-2615	RES,26.1K OHM,1/10W,1%	1	R130
.....3	102-3160	RES,CHIP,3.16K OHMS,1/10W,1%,SMD	5	R34, R36, R116, R117, R153
.....3	102-3570	RES,CHIP,357 OHMS,1/10W,1%,SMD	1	R152
.....3	102-4022	RES,CHIP,40.2K OHMS,1/10W,1%,SMD	2	R148, R182
.....3	102-4321	RES,CHIP,4.32K OHMS,1/10W,1%,SMD	1	R70
.....3	102-4992	RES,49.9K OHMS,1/10W,1%,SMD	4	R44, R122, R124, R151
.....3	102-4993	RES,CHIP,499K OHMS,1/10W,1%,SMD	1	R15
.....3	102-5041	RES,4.99K OHM,1/10W,1%	2	R75, R77
.....3	102-5231	RES,5.23K OHM,1/10W,1%	1	R179
.....3	102-6191	RES, CHIP, 6.19K OHM, 1/10W, 1%	1	R57
.....3	102-6193	RES,CHIP,619 OHM,1/10W,1%	1	R173
.....3	102-6341	RES,CHIP,6.34K,1/10W,1%,SMD	1	R192
.....3	102-6982	RES,CHIP,69.8K,1/10W,1%,SMD	3	R133, R137, R14
.....3	102-7501	RES,7.5K OHMS,1/10W,1%,SMD	4	R20, R54, R73, R150
.....3	102-8454	RES,CHIP,8.45K OHM,1/10W,1%	3	R131, R125, R183
.....3	102-9094	RES,CHIP,9.09K OHM,1/10W,1%	2	R11, R147
.....3	102-9095	RES,90.9K OHM,1/10W,1%,SMD	1	R32
.....3	102-9101	RES CHIP 90.9 OHM 1/10W 1%	1	R82
.....3	103-1007	RES,1 MEG OHM,1/4W,1%,METAL	4	R39, R40, R47, R48
.....3	103-1584	RES,1.58K OHM,1/4W,1%,METAL	4	R51, R97, R98, R99
.....3	103-7503	RES,750 OHM,1/4W,1%,METAL	1	R52
.....3	110-5623	RES,56 OHM,1/2W,5%	2	R67, R68
.....3	110-8223	RES,82 OHM,1/2W,5%	1	R190



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	111-0002	.02 OHM 3W CURRENT SENSE RES, SMT	3	R3, R4, R5
.....3	120-1043	RES,1K OHM,1W,5%	1	R201
.....3	130-0100	RES, 250 VAC, 7A, FUSED	1	R1
.....3	130-1033-300	RES,100 OHM,3W,1%	2	R64, R65
.....3	130-1843	RES,1.8K OHM,2W,5%	2	R81, R198
.....3	130-2223	RES,22 OHM,2W,5%	2	R210, R211
.....3	130-2263	RES,220K OHM,2W,5%	6	R107, R108, R109, R175, R176, R177
.....3	130-3333	RES,330 OHM,2W,5%	2	R199, R200
.....3	140-0037	VARISTOR,V275LA40A	3	MOV1, MOV2, MOV3
.....3	140-0039	VARISTOR,V320LA40B	1	MOV4
.....3	200-1520	DIODE, 15A, 200V	4	D43, D44, D45, D46
.....3	200-1620	DIODE,FAST RECOVERY,16JPF20	1	D37
.....3	200-3030	DIODE, 300V, 30A, SWITCHING	1	D36
.....3	203-0360	DIODE,SCHOTTKY,3A,60V,MBR360	1	D24
.....3	203-5817	DIODE, 1N5817, 1A, 20V	2	D15, D64
.....3	203-5820	DIODE, 1N5820, 3A, 20V	1	D14
.....3	204-0037	DIODE,ZENER,7.5V,225mW,SMD	2	D16, D70
.....3	204-0040	DIODE,ZENER,12V,6%,1W,SMAZ12-13,SMD	2	D32, D42
.....3	204-0041	DIODE,ZENER,15V,225mW,SMD	2	D5, D72
.....3	204-0043	DIODE,ZENER,43V,225mW,SMD	1	D71
.....3	204-0336	DIODE,REFERENCE,2.5V,SMD	3	D23, D52, D53
.....3	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	38	D6, D7, D8, D12, D13, D20, D22, D30, D31, D41, D47, D48, D49, D50, D51, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D65, D66, D67, D68, D69, D78, D81, D82, D85, D86, D87, D88, D89

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	204-4005	DIODE, 1A, 600V, 4005, SMD	9	D17, D18, D26, D27, D28, D38, D39, D83, D84
.....3	206-0024	TRANSZORB DIODE, +/-24V, 1.5KE24CA	2	D74, D75
.....3	206-0300	TRANSZORB,300V ,SMD	3	D77, D79, D80
.....3	210-0520	HEXFET IRFI520G	2	Q6, Q26
.....3	210-1201	FET, SWITCHING, 1200VDC 8A, 2.1 OHMS RDS ON	1	Q10
.....3	210-5085	RF FET 85MOHM 500V	3	Q2, Q8, Q9
.....3	216-0113	IC, OPTO, HIGH SPEED	1	U11
.....3	216-0337	VR, LM337 NEGATIVE, SMD	1	U24
.....3	216-0339	IC,LM339AM,VOLTAGE COMPARATOR,SMD	4	U1, U20, U22, U23
.....3	216-0433	IC,OPTO PS2705-1,SMD	8	U13, U14, U15, U18, U19, U21, U25, U26
.....3	216-3825	IC, PWM, UC3825DW, SMD	2	U7, U10
.....3	216-3854	IC, PFC UC3854DW, SMD	1	U4
.....3	216-4081	IC,MC14081BD,QUAD 2-INPUT AND,SMD	1	U3
.....3	216-4093	IC,MC14093BD,QUAD 2-INPUT NAND,SMD	1	U16
.....3	216-4420	IC, DRIVER, TC4420, 6A	1	U9
.....3	216-4538	IC,MC14538BD DUAL MULTIVIBRATO,SMD	1	U29
.....3	216-7002	IC,MOSFET,2N7002LT1,SMD	23	Q1, Q3, Q4, Q5, Q7, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q27, Q28, Q29
.....3	220-4429	IC,DRIVER,MOSFET,TC4429CAT (N)	1	U12
.....3	227-0317	VR,LM317T,LM317KC	2	U17, U27
.....3	227-2576-012	VR, +12V FIXED VOLTAGE REGULATOR 3A, SWITCHER, LM2576HVT-12	1	U6
.....3	229-1750	TMP01FP TEMPERATURE SENSOR CHIP	1	U28
.....3	230-0013	RECT,FAST RECOVERY,FEN30JP	1	D25

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	230-0015	RECT,SILC,MR2406	4	D1, D2, D3, D4
.....3	230-0017	RECT,PWR SWITCHMOD MUR4100E	2	D34, D35
.....3	239-0001	BRDG RECT,FULL WAVE 2 AMP,200V	2	D19, D21
.....3	270-0066	REL,DPDT,12VDC,DIP	2	K4, K5
.....3	270-1213	REL,SPST,30A	3	K1, K2, K3
.....3	320-0011	LED,R.ANGLE PCB RED 5300E1 1D1	11	DS1, DS5, DS6, DS7, DS8, DS9, DS10, DS11, DS12, DS13, DS14
.....3	330-0004	FUSE,500MA,5X20MM,250V,SLO-BLO	2	F8, F10
.....3	330-0006	FUSE,1.5A,2014,FAST-ACTING	1	F6
.....3	330-0007	FUSE,4A,2014,FAST-ACTING	2	F4, F7
.....3	330-0009	FUSE,10A,2014,FAST-ACTING	1	F5
.....3	330-0800-001	FUSE,8A,250V,3AG,SLO-BLO	1	F9
.....3	330-1500-001	FUSE, 15A, 250V, CERAMIC, SLO-BLOW	2	F1, F2
.....3	334-1150	FUSE,5 X 20MM,1.5A,SLO-BLO	1	F3
.....3	340-0004	SW,JUMPER PROGRAMMABLE	2	P6, P7
.....3	360-0165	IND, .78 UH, 15A	2	L4, L6
.....3	360-0167	IND, .56 UH, 6A	3	L5, L7, L8
.....3	360-0170	IND, 100 UH, 14A	1	L3
.....3	360-5812	IND, POWER SUPPLY PFC	1	L1
.....4	375-5812	CORE, PS PFC INDUCTOR (NOTE)	2	
.....4	640-1800	WIRE AWG 18 EN MAGNET	0.044	
.....3	366-0331	IND, 330 UH, 1A RMS, SMD	1	L2
.....3	370-0064	XFMR, 48V SUPPLY, DTC EXCITER	1	T3
.....3	370-0065	XFMR FLYBACK SUPPLY DTC EXCITER	1	T4
.....3	370-0066	XFMR,DRIVE,POWER SUPPLY,DTC EXCITER	1	T6
.....3	370-0150	XFMR, CURRENT SENSE, 50:1	2	T2, T5
.....3	376-0257	XFMR, LOW VOLTAGE	1	T1

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	402-0015	TIE,CBL,PANDUIT, 7 3/8 LONG"	4	
.....3	409-0033	INSULATOR, TO247-2, 86/37 KERATHERM, .225MM THK.	3	
.....3	413-1206	CHIP,TEST POINT,1206,SMD	25	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25
.....3	415-2068	CLIP,FUSE,15AMP,LITTLEFUSE,102071	6	XF1, XF2, XF9
.....3	415-2069	CLIP,FUSE,LITTLEFUSE,111501	6	XF3, XF8, XF10
.....3	417-0044	CONN,10 PIN SINGLE ROW HEADER	2	J2, J8
.....3	417-0308	CONN,JACK,3-PIN,SMD	2	J6, J7
.....3	417-0398	CONN, MALE PCB MT	2	J1, J3
.....3	417-0804	SOCKET,8-PIN DIP,BURNDY	1	XU28
.....3	418-451	Diode, SMT, Zener, 5.1V Motorola BZX84C5V1LT1	2	D29, D33
.....3	420-4108	SCREW,4-40X.500,S.S. PH	3	
.....3	420-6104	SCREW,6-32X.250,S.S. PH	3	
.....3	420-6106	SCREW,6-32X.375,S.S. PH	4	
.....3	421-6001	6-32 S.S. HEX THIN NUT	4	
.....3	423-4001	#4 FLAT SS .250 X .125 X .018	3	
.....3	423-4002	#4 LOCK S.S. SPLIT	3	
.....3	423-6001	#6 FLAT .250 X .150 X .015	3	
.....3	423-6002	#6 LOCK SPLIT	10	
.....3	441-0012	STOFF,#6-32 MALE-FEMALE 1/4	3	
.....3	441-0215	SPACER, RESISTOR	2	
.....3	455-0037	HEATSINK,AAVID 530101B00150,PCB MNT W CLIP	4	XD36, XD37, XQ8, XQ9
.....3	455-0071	HEATSINK,CLIP-ON,PCB MT,TO-220	3	XU6, XD43, XD44



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	455-0075	HEATSINK,TO-220 PKG,.85 TALL	4	XD1, XD2, XD3, XD4
.....3	455-8000-001	HEATSINK,2 INCH,A" VERSION AM"	1	
.....3	519-0540	PCB, MACH, DTC EXCITER POWER SUPPLY	1	
.....3	550-123	Connector, 10 pin header (cut from 550-162)	1	J4
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.417	
.....3	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	J5
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
.....3	601-1893	WIRE,AWG18,19/30,TFE INS,WHT	0.417	
.....3	611-0060	TUB, HT SHK, 1/16	0.17	
.....3	611-3750	TUB,HT SHK,3/8	0.083	
..1	959-0545	ASSY, POWER AMP, 250W DTC DIGITAL EXCITER	1	
....2	130-5623	RES,560 OHM,2W,5%	1	R165
....2	131-5034	RES,50 OHM,250W,5%,ALN,FLANGE MT	2	R92, R93
....2	210-2918	TSTR, RF POWER, SD2918	1	Q9
....2	210-2931	TSTR, RF POWER, SD2931-10	2	Q10, Q11
....2	360-0150-001	COIL, 18AWG, 0.25 IN. DIA., 22T	1	
.....3	640-1800	WIRE AWG 18 EN MAGNET	0.03	
....2	360-0168	COIL,16GA,4.5T,50nH (SBCM)	3	L8, L12, L15
.....3	640-1600	WIRE,ENAMELED 16GA.	0.003	
....2	360-0169	COIL,14GA,2.5T,70nH (SBCM)	4	L16, L17, L18, L19
.....3	640-1400	WIRE,14GA,MAGNET	0.005	
....2	420-2107	SCREW,2-56X.437,S.S. PH SC	8	
....2	420-4106	SCREW,4-40X.375,S.S. PH	10	
....2	421-6908	SHEET EDGE CONNECTOR 6-32	3	
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	21	
....2	423-2002	#2 LOCK SPLIT	8	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	423-4002	#4 LOCK S.S. SPLIT	10	
....2	427-0061	CONNECTOR, N, PCB, STRAIGHT, PNL MTG	1	J7
....2	455-8012	HEATSINK,AMPLIFIER,DTC EXCITER	1	
....2	469-0000	FINGERSTOCK,CLIP-ON,LAIRD 97-973	6	
....2	469-0366	FINGER STOCK (NOTE!!!!)	14	
....2	471-5332	SHIELD,POWER AMPLIFIER,DTC EXCITER	1	
....2	471-5342	SPACER,90 DEGREE HYBRID,DTC EXCITER AMPLIFIER	2	
....2	471-5345	SHIELD, POWER AMPLIFIER, FXi60	1	
....2	471-5346	SHIELD, COIL, P.A., FXi60/250	1	
....2	519-0555	PCB, MACH, POWER AMP, SUB BOARD	1	
....2	565-0001	COUPLER, 3DB, 600W, 70-110 MHZ, PCB MT	2	HY1, HY2
....2	594-0503	LABEL, DANGER-HAZARDOUS VOLTAGE	1	
....2	919-0545	PCB, ASSY, POWER AMP, 250W DTC DIGITAL EXCITER (SBCM)NOTE!!!	1	
.....3	003-0105	CAP, CER, 1UF, 100V, 1812, 20%, SMD	2	C44, C49
.....3	006-1006	CAP,47 uF,Electrolytic,63V,SMD (NOTE)	4	C31, C37, C55, C62
.....3	006-1075-350	CAP,LYTIC,10uF,35V,20%,NP,SMD	3	C24, C46, C47
.....3	007-1012	CAP,CER,10pF,50V,2%,SMD	2	C26, C77
.....3	007-1024	CAP,CER,.001uF,50V,10%,SMD	9	C19, C21, C25, C34, C45, C48, C72, C80, C98
.....3	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	22	C1, C5, C7, C14, C15, C16, C18, C20, C22, C23, C73, C74, C79, C81, C86, C84, C85, C87, C88, C90, C91, C92
.....3	007-1044-200	CAP, CHIP, .1UF, 200V, 20%, SMD	13	C2, C3, C4, C6, C8, C9, C10, C11, C12, C13, C94, C95, C99
.....3	007-1054	CAP,CER,1uF,50V,10%,SMD	1	C35



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	007-1054-001	CAP,CER,1UF,10%,10V,X7R,0805,SMD	4	C100, C101, C102, C103
.....3	007-1075-100	CAP, CER CHIP, 10 UF, 10V, 1206	1	C71
.....3	007-2202-500	CAP,CER,22pF,50V,2%,SMD	1	C78
.....3	007-2704-001	CAP, EMI FILTER, SMD	9	FL10, FL11, FL12, FL13, FL14, FL15, FL16, FL17, FL20
.....3	007-3312	CAP,CER,33pF,50V,2%,SMD	1	C76
.....3	009-1013	CAP,CER CHIP,10PF,500V,5%	1	C29
.....3	009-1023	CAP,CER CHIP,100PF,500V,5%	6	C56, C57, C63, C64, C104, C105
.....3	009-3313	CAP,33pF,PORCELAIN,500V,5%,SMD	5	C38, C41, C52, C66, C70
.....3	009-4723	CAP,CER CHIP,470PF,200V,5%	12	C27, C30, C32, C36, C39, C40, C53, C54, C59, C60, C65, C89
.....3	009-6210-001	CAP,CER CHIP,6.2PF,+/-0.1PF,500V (NOTE)	1	C28
.....3	009-6813	CAP,CER CHIP,68PF,500V,5%	5	C58, C61, C67, C68, C69
.....3	009-8013	CAP,CER CHIP,82PF,500V,5%	5	C33, C42, C43, C50, C51
.....3	020-4785	CAP,LYTIC,470UF,100V,20%,STDUP	2	C106, C107
.....3	070-1064	CAP,TANT,10uF,35V,20%,SMD	2	C82, C83
.....3	102-0000	RES,CHIP,0 OHM,0805,SMD	17	R2, R3, R10, R11, R12, R13, R14, R15, R56, R66, R67, R77, R113, R115, R120, R163, R166
.....3	102-1001	RES,CHIP,1.00K OHMS,1/10W,1%,SMD	27	R4, R5, R22, R23, R24, R25, R26, R27, R31, R73, R82, R86, R87, R89, R90, R63, R64, R133, R154, R155, R156, R157, R158, R159, R160, R161, R162

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	102-1002	RES,CHIP,10.0K OHMS,1/10W,1%,SMD	27	R1, R32, R33, R36, R37, R38, R39, R40, R43, R45, R46, R49, R54, R55, R58, R60, R61, R62, R65, R108, R123, R127, R129, R131, R134, R146, R147
.....3	102-1003	RES,CHIP,100K OHMS,1/10W,1%,SMD	1	R7
.....3	102-1212	RES,CHIP,12.1K OHMS,1/10W,1%,SMD	2	R16, R21
.....3	102-1510	RES, 15 OHM, 1/10W, 1%	12	R41, R51, R52, R53, R59, R70, R118, R124, R125, R126, R132, R151
.....3	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	8	R35, R42, R44, R47, R117, R128, R130, R150
.....3	102-2210	RES,CHIP,221 OHMS,1/10W,1%,SMD	14	R97, R98, R99, R100, R101, R102, R104, R106, R107, R121, R122, R135, R136, R152
.....3	102-3010	RES, CHIP, 301 OHMS, 1/10W, 1%, SMD	5	R34, R71, R72, R116, R119
.....3	102-3012	RES,CHIP,30.1K,1/10W,1%,SMD	4	R17, R18, R19, R20
.....3	102-4992	RES,49.9K OHMS,1/10W,1%,SMD	2	R8, R9
.....3	102-5110	RES,CHIP,511 OHMS,1/10W,1%,SMD	2	R96, R110
.....3	102-6409	RES,CHIP,64.9 OHMS,1/10W,1%,SMD	2	R48, R94
.....3	102-7521	RES,CHIP,75 OHMS,1/10W,1%,SMD	3	R95, R111, R112
.....3	104-0301	RES, CHIP, 301 OHM, 1%, 1/2W, 2010, SMD	1	R148
.....3	105-0001	RES, 1 OHM, 1%, 1/2W, SMD, 2010	1	R6
.....3	105-0010	RES, CHIP, 10 OHM, 1W, 1%, 2512	3	R103, R105, R164
.....3	105-0043	RES,CHIP,43 OHM,5%,1W,SMD	1	R79
.....3	105-0120	RES, CHIP, 120 OHM, 1W, 5%, 2512	2	R78, R80
.....3	111-0001	.01 OHM 2W CURRENT SENSE RES SMT	3	R28, R29, R30



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	185-103	Resistor, 10K ohm 1/8 watt 1% chip Dale CRCW1206-10K	3	R74, R75, R76
.....3	198-0503	TRMR,50K,TOP ADJUST,SMD	2	R50, R57
.....3	198-1044	TRMR,1K OHMS,TOP ADJ,SMD	1	R109
.....3	198-2024	TRMR,2K OHMS,TOP ADJUST,10 TURN,SMD	4	R68, R83, R88, R153
.....3	201-2801	DIODE,HOT CARRIER,MMBD701LT1,SMD	3	D3, D11, D12
.....3	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	5	D1, D2, D5, D8, D10
.....3	210-0010	TSTR, MOSFET, 12A, 100V, N-CHANNEL, DPAK, SMT	1	Q12
.....3	210-1000	DIODE, ZENER, 10V, 225MW, SMD, SOT23	3	D6, D13, D14
.....3	210-1150	DIODE, ZENER, SMT, 15V, 3W, D0-214AA	3	D4, D7, D9
.....3	210-3310	P CHAN ENH MODE FET 60V SOT23	4	Q1, Q2, Q3, Q4
.....3	210-3906-001	TSTR,3906,SMD	1	Q6
.....3	210-5700	RF POWER TRANSISTOR, PD57002	1	Q8
.....3	216-3904	TSTR,MMBT3904LT1,NPN,SMD	2	Q5, Q7
.....3	220-0035	IC,LM35DZ CELSIUS TEMP SENSOR	1	U6
.....3	221-0074-S	IC,TL074 OP-AMP,QUAD,SMD	3	U1, U4, U8
.....3	221-0284	DUAL RAIL TO RAIL OP AMP 4 MHZ BW	2	U2, U3
.....3	221-8361	IC, TRUE AVERAGE POWER DETECTOR	1	U7
.....3	231-7805	VR,78L05AC,POS VOLT,100mA,SMD	1	U5
.....3	330-0060	FUSE, SMD, 1206, 1A, 63V	3	F3, F4, F5
.....3	330-0061	FUSE, SMD, 15A, 65V	2	F1, F2
.....3	350-188	INDUCTOR, 1210 1uH CHIP	4	L1, L7, L10, L11
.....3	350-203	IND, SMT, 1812, 33 NH	1	L6
.....3	366-0100	IND,100NH LAMINATED CER,0805,SMD	2	L20, L21
.....3	366-0126	INDUCTOR,SMD,AIR CORE,11T,130nH	1	L5
.....3	366-0127	INDUCTOR,SMD,AIR CORE,20T,538nH	1	L3
.....3	366-0128	INDUCTOR,SMD,AIR CORE,100nH	1	L2

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	366-0130	INDUCTOR,POWER,SMD,1uH,10A	4	L4, L9, L13, L14
.....3	366-6152	FERRITE,CHIP IMPEDANCE 1500OHMS @ 100MHZ MULTILAYER, 0805	8	FL1, FL2, FL3, FL4, FL5, FL6, FL7, FL8
.....3	407-0500	EMI SHIELD, MODIFIED 50KE-CBSAFN-.75x1.5x.50	1	
.....3	407-0501	EMI SHIELD, MODIFIED 50KE-CBSAFN-2.5x3.25x.50	1	
.....3	417-0214	CONN,HEADER 20 PIN R.ANGLE	1	J1
.....3	417-0265	CONN,BNC,JACK,THREADED,PC EDGE MOUNT,LOW PROFILE	1	J4
.....3	417-0398	CONN, MALE PCB MT	1	J3
.....3	417-0701	CONN,SMA FEMALE PC MOUNT	2	J2, J6
.....3	471-8050	MICROSTRIP OVERLAY	2	W5, W6
.....3	519-0545	PCB, MACH, POWER AMP, 250W DTC DIGITAL EXCITER	1	
.....3	550-186	Connector, 3 pin Molex header (cut from 550-162)	1	J5
.....4	550-162	Connector, 24 pin break-away (straight) Molex 26-48-6248	0.125	
.....3	809-0180	JUMPER, COAX, SEMI-RIGID, 1.8 IN	1	W4
.....3	809-0350	JUMPER, COAX, SEMI-RIGID, 3.5 IN	1	W3
..1	979-0540	KIT, INSTALLATION, DTC DIGITAL EXCITER	1	
....2	417-0291	CONN,PLUG,25-PIN,D",SOLDER CUPS"	1	
....2	417-0910	KIT,BACKSHELL FOR 9-PIN D CONN	1	
....2	417-2510	KIT,BACKSHELL FOR 25PIN D CONN	1	
....2	417-3288	ADAPTER,BNC-JACK TO N-PLUG,50 OHM(N	1	
....2	420-0007	SCREW,12-24 X 3/4,NATURAL SST,TRUSS HD, PHILLIPS DRIVE"	4	
....2	420-0710	SCR,10-32 X 5/8,NATURAL SST,TRUSS HD,PHILLIPS DRIVE"	4	
....2	421-0002	12-24 SPEED NUT (NOTE)	4	
....2	550-111	CONNECTOR, D-SUB 9 PIN FEMALE	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	682-0001	CORD LINE,3 COND,DETACH 7.5FT	1	
....2	682-0003	CORD,PWR EUROPEAN RIGHT ANGLE, 6'	1	
....2	701-0007	ANTISTATIC ZIPLOC BAG 12X12	1	
....2	804-5002	NULL MODEM ADAPTOR DB9F TO DB9F	1	
....2	829-4217	PLUG,MALE XLR, A3M (XLR-3-12C)	3	
....2	849-0902	CBL ASSY,COMPUTER,DB9-DB9,M/F,6FT	1	
..1	979-0541	KIT, BINDER AND MANUAL, DTC DIGITAL EXCITER	1	
....2	597-0541	INSTRUCTION MANUAL, FXI 60/250, FM DIGITAL EXCITER	1	
.....3	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	1	
....2	598-0008	BINDER,2 IN, BLUE W CD POCKET (NOTE)	1	

6.3 EXGINE KIT FOR FACTORY BUILD

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	979-0600-001	KIT,EXGINE,FOR FACTORY BUILD FM FXi 60/250		
..1	417-0910	KIT,BACKSHELL FOR 9-PIN D CONN	1	
..1	418-1550-010	CONN, PLUG 10-PIN CAGE CLAMP 3.81MM SPACING	2	
..1	471-5363	FILLER,DAUGHTER CARD,PLAIN.FXi60/250	-1	
..1	471-5365	FILLER,DAUGHTER CARD,EXGINE,FXi60/250	1	
..1	471-5367	FILLER,OPTIONS,BLANK,FXi60/250	-1	
..1	500-211	Screw,SEMS 4-40x3/8 Ph Pan Head MS Black Zinc (External)	4	
..1	550-111	CONNECTOR, D-SUB 9 PIN FEMALE	1	
..1	597-0545	APPLICATION GUIDE, FXI 60/250 EXGINE UPGRADE	1	
....2	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	0.001	

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
..1	701-0004	ANTISTATIC ZIPLOC BAG 6X8 4MIL	1	
..1	701-0007	ANTISTATIC ZIPLOC BAG 12X12	1	
..1	701-1008-012	BAG,STATIC SHIELDING, 8X12	1	
..1	710-2618	SCREWDRIVER,SLOTTED,1.8mm X 40mm	1	
..1	804-5002	NULL MODEM ADAPTOR DB9F TO DB9F	1	
..1	829-4216	PLUG,FEM XLR, A3F (XLR-3-11C)	1	
..1	919-0600	PCB, ASSY, EXGINE CARD (SBCM)	1	
....2	006-4775-350	CAP,ELECTRO,47UF,20%,35V,SMD	1	C222
....2	007-0010	CHIP CERAMIC 10pF 50V 5% 0603 SMD	1	C256
....2	007-0018-006	CAP,0603,18pF,50V,5%	1	C204
....2	007-0207-006	CAP,0.27uF,6.3v,10%,0603	1	C202
....2	007-0270-006	CAP,270pF,50v,5%,0603	1	C53
....2	007-1013-050	CAP,CER,100 PFD,5%,50V,0603,SMD	2	C36, C261
....2	007-1022	CAP,CER,100pF,50V,2%,SMD	1	C48
....2	007-1023-025	CAP,CER,1 NFD,5%,25V,0603,SMD	6	C40, C69, C199, C205, C247, C264
....2	007-1024	CAP,CER,.001uF,50V,10%,SMD	1	C64
....2	007-1034-001	CAP,CER,.01UF,10%,50V,0603,SMD	144	C17, C18, C19, C71, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125,



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	007-1040-025	CAP,CER,.1UF,+80,-20%,25V,0603,SMD	16	C181, C186, C187, C189, C190, C191, C192, C195, C196, C201, C207, C227, C257, C263, C266, C302
....2	007-1044	CAP,CER,0.1uF,50V,10%,SMD note	39	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C20, C26, C27, C28, C29, C30, C31, C32, C42, C43, C45, C46, C47, C57, C66, C194, C226, C241, C242, C246, C248, C249, C250
....2	007-1044-016	CAP,CER,100 NFD,10%,16V,0603,SMD	1	C35
....2	007-1054	CAP,CER,1uF,50V,10%,SMD	9	C21, C22, C23, C24, C25, C59, C61, C254, C258
....2	007-1075-100	CAP, CER CHIP, 10 UF, 10V, 1206	1	C50
....2	007-1512-050	Cap,Cer,15 pF 5%,0603,50V,SMD	1	C255
....2	007-1524-500	CAP,CER,.0015uF,50V,10%,SMD	1	C52
....2	007-2723-025	CAP,CER,2.7 NFD,10%,25V,1206,SMD	1	C34
....2	007-2724-500	CAP,CER,.0027uF,50V,10%,SMD	1	C260
....2	007-3344-016	CAP,CER,330 NFD,10%,16V,1206,SMD	1	C38
....2	007-3923	CAP,CER,390pF,100V,5%,SMD	2	C62, C63
....2	007-6800-500	CAP,CER,6.8pF,50V,.25pF,SMD	1	C56
....2	007-6800-501	CAP,CER,6.8nF,10%,50V,0603,SMD	1	C55
....2	009-0202	CAP,TANALUM CHIP,100UF,POLAR,10%,6V,SMD	3	C54, C252, C253
....2	009-0407-001	CAP,4.7uF,12.5v,20%,ELECTROLYTIC,D	1	C203
....2	064-2262	CAP,TANT,2.2uF,10V,SMD	1	C51
....2	070-1054	CAP,TANT,1uF,35V,10%,SMD	7	C41, C44, C183, C229, C243, C244, C269

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	070-1064	CAP,TANT,10uF,35V,20%,SMD	15	C67, C68, C72, C176, C179, C193, C197, C200, C206, C223, C228, C245, C259, C265, C305
....2	070-1084-L16	CAP,TANT,100 MFD,20%,16V,E CASE,LOW ESR,SMD	4	C37, C39, C58, C65
....2	070-2204	CAP,TANT,22uF,25V,10%,SMD	3	C33, C60, C262
....2	070-2265-L25	CAP,TANT,22 MFD,20%,25V, E CASE,LOW ESR,SMD	3	C49, C70, C251
....2	102-1133	RES,CHIP,110 OHMS,1/10W,1%,SMD	1	R45
....2	102-1432	RES, CHIP, 14.3K, 1/10W, 1%, SMD	1	R22
....2	102-1531	RES,150 OHM,1/10W,1%	4	R2, R3, R4, R5
....2	102-1582	RES,CHIP,15.8 K, 1/10 W, 1%	1	R28
....2	102-1623	Res,Chip 162K 1/10W 1% SMD	1	R24
....2	102-1741	RES,CHIP,1.74K OHMS,1/10W,1%,SMD	1	R10
....2	102-2002	RES,CHIP,20.0K OHMS,1/10W,1%,SMD	1	R43
....2	102-2430	RES,CHIP,243 OHMS,1/10W,1%,SMD, 0805	1	R192
....2	102-3001	RES,CHIP,30.1 OHMS,1/10W,1%,SMD	1	R58
....2	102-3011	RES,CHIP,3.01K OHMS,1/10W,1%,SMD	1	R348
....2	102-3320	RES,CHIP,332 OHMS,1/10W,1%,SMD	1	R12
....2	102-4751	RES,CHIP,4.75K OHMS,1/10W,1%,SMD	1	R11
....2	102-503	POT, 50K OHM 3/8 SQUARE, 1/2W, 10%"	1	R516
....2	102-5622	RES, 5.62K OHM, 1%, 1/10W, SMD	5	R253, R254, R311, R312, R313
....2	102-6815	RES,CHIP,68.1K OHM,1/10W,1%	1	R190
....2	102-9095	RES,90.9K OHM,1/10W,1%,SMD	1	R21
....2	104-0000	RES,CHIP,0 OHM JUMPER,0603,SMD	8	R54, R59, R61, R65, R72, R193, R316, R458
....2	104-0010	RES,CHIP,10.0 OHM,1%,1/16W,0603,SMD	2	R20, R379



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-0022	RES,CHIP,22.1 OHM,1%,1/16W,0603,SMD	223	R13, R14, R15, R16, R17, R18, R19, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100, R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130
....2	104-0049	RES,CHIP,49.9 OHM,1%,1/16W,0603,SMD	2	R63, R194
....2	104-0051	RESISTOR,51.1ohm1%,1/16W,SMD,0603	4	R66, R76, R186, R324
....2	104-0820	RESISTOR,825ohm,1%,1/16W,SMD,0603	1	R74
....2	104-1001	RES,CHIP,1.0 K OHM,1%,1/16W,0603,SMD	50	R26, R27, R34, R35, R36, R39, R40, R41, R42, R187, R191, R195, R250, R314, R339, R340, R341, R342, R343, R344, R345, R359, R360, R363, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R513, R514, R515

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	104-1002	RES,CHIP,10.0 K OHM,1%,1/16W,0603,SMD	33	R23, R25, R29, R33, R38, R44, R46, R47, R48, R49, R50, R51, R52, R53, R55, R79, R184, R185, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R346, R347, R443
....2	104-1201	resistor,1.21Kohm1/16W,1%,SMD,0603	5	R30, R68, R69, R70, R71
....2	104-1503	RES,CHIP,150K,1%,1/16W,0603,SMD	1	R356
....2	104-2000	RESISTOR,2Kohm,1/16W,1%,SMD,0603	1	R56
....2	104-2001	RES, CHIP, 200 OHM, 1%, 1/16W, 0603, SMD	14	R37, R75, R80, R81, R188, R251, R252, R317, R318, R319, R320, R321, R322, R357
....2	104-4222	RES CHIP, 42.2K, 1%, 1/16W, 0603, SMD	1	R326
....2	104-4701	RES,CHIP,4.75KOHM,1%,1/16W,0603,SMD	1	R67
....2	104-4991	RES, CHIP, 4.99K, 1%, 1/16W, 0603, SMD	3	R31, R32, R325
....2	104-6811	RES,CHIP,6.81 K OHM,1%,1/16W,0603,SMD	1	R9
....2	104-8200	Chip Res, 8.25K 1% 1/16W 0603 SMD	1	R8
....2	104-8202	RESISTOR,82.5K,1%,1/16W,SMD,0603	1	R73
....2	176-2011	RES,TRMR,20K OHM,25T,TOP,3299W	1	R57
....2	204-0130	SCHOTTKY BARRIER RECTIFIER 1 AMP 30V CASE 403A SMD	1	D4
....2	204-0340	DIODE,RECTIFIER,SCHOTTKY,MBRS340T3, 403-03 CASE,SMD	2	D1, D9
....2	204-0914	DIODE,SWITCHING,MMBD914LT1,SMD	1	D3
....2	204-2800	DIODE,SCHOTTKY,HSMS-2800,SOT-23	2	D5, D6
....2	204-4150	DIODE,SWITCHING,LL4150,MINIMELF CASE,SMD	1	D2
....2	210-0093	TRANSISTOR,BFR93A,SOT-23,SMD	2	Q5, Q7

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	216-0420	CLC420, HIGH SPEED VOLTAGE FEEDBACK OP AMP SMD	2	U25, U26
....2	216-0634	IC, BUFFER, BUF634U, SO-8, SMD	2	U33, U34
....2	216-3904	TSTR,MMBT3904LT1,NPN,SMD	3	Q1, Q2, Q3
....2	216-6245	IC PI74LPT16245AA 16 Bit BIDIR Transcvr 48TSSOP SMD	2	U1, U2
....2	216-6531	IC, SN65LVDS31D HIGH SPEED DIFFENENTIAL LINE DRIVER SMD	1	U40
....2	216-7002	IC,MOSFET,2N7002LT1,SMD	2	Q4, Q6
....2	216-8074	IC,FCT38074,3.3V,CLOCK DRIVER,SOIC	2	U22, U27
....2	216-8541	IC, DAC 16-BIT SINGLE CH. PQFP-32	1	U20
....2	221-0358-001	DUAL OP AMP, SMD, SOIC8	1	U23
....2	224-0160	IC, PAGE FLASH, 16 MEG, SMD (NOTE D.N.S.)	2	U5, U6
....2	224-0708	IC, MICRO SUPERVISOR, 3V, SMD	1	U4
....2	224-1204	IC,FPGA,CYCLONE,256-PIN,BGA	1	U18
....2	224-2045	IC,DUAL,BUS TRANSCEIVER,SSOP-DCT8	1	U37
....2	224-2410	IC,RS-232 MULTI-TRANSCEIVER,+5V,SMD	1	U7
....2	224-4001	200MHZ CLOCK GENERATOR PLL	1	U28
....2	224-4192	IC, 192KHZ DIGITAL AUDIO TRANSMITTER	1	U31
....2	224-4832	IC,128MB,SDRAM,166MHz,86-PIN,TSOP	5	U14, U15, U16, U17, U30
....2	224-6373	IC, 16 BIT LATCH, LV, SMD	2	U3, U32
....2	224-6415	IC,FIXED-POINT DSP,600MHz,532-PIN,BGA	1	U13
....2	226-4740	RES NET,4.7K,10-PIN,.1 SPACE	3	R1, R6, R7
....2	227-1576	VR, LT1576IS8, SWITCHER, 1.5A, SMD	1	U12
....2	227-7650	IC,SWITCHING REGULATOR,3A,300kHz,DFN	1	U11
....2	231-1374	VR,LT1374HVCS8,SWITCHING,4.5A,SO-8,SMD	1	U9
....2	231-2700	STEP-UP PWM DC/DC CONVERTOR, 2.5A	1	U21

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	298-157	Capacitor,Tantalum,SMT,size X,150uF,16V Kemet T491X157K016AS	4	C180, C306, C307, C308
....2	325-0251	LED, GRN, SMD, 0805	12	DS5, DS6, DS7, DS8, DS13, DS14, DS15, DS16, DS20, DS21, DS23, DS24
....2	325-0252	LED,RED/ORN,1206,SMD	5	DS1, DS2, DS3, DS4, DS11
....2	325-0253	LED,YELLOW,1206,SMD	1	DS12
....2	325-0255	LED,BLUE, 0603, SMD	3	DS17, DS18, DS19
....2	340-0004	SW,JUMPER PROGRAMMABLE	3	P14, P15, P18
....2	342-3304	SW,TACT,SPST,N.O.,SMD,RECESSED	2	S1, S4
....2	350-197	INDUCTOR, SMT, POWER, 1uH	2	L10, L12
....2	360-0103	FILTER EMI CHIP, 10000pF 50V 20% SMD	1	FL1
....2	360-0125-001	Inductor 68uH SMD	1	L11
....2	360-0167	IND, .56 UH, 6A	1	L22
....2	366-0010-001	IND,10UH,1.5A	3	L8, L30, L31
....2	366-0011	IND,10UH,SHIELDED,SMD	2	L9, L17
....2	366-0180-001	INDUCTOR, 180nH, 10%, SMD, 1008	2	L5, L6
....2	366-0334	IND,3.3uH,2A,10%,SMD	1	L7
....2	366-2204	IND,22 uH,10%,LQH3C220K04,1210,SMD	3	L4, L18, L29
....2	366-3100	FERRITE, 600 OHMS, 1.5 AMP, 100MHZ,1206 SMD	6	L15, L16, L20, L21, L23, L24
....2	366-6825	IND,POWER,SHIELDED,6.8 uH,20%,DT3316 CASE,SMD	4	L1, L2, L3, L28
....2	367-9370	XFMR,SMT,AES/EBU,SC937-02	1	T1
....2	390-3900	CRYSTAL,OSC,10MHz,VCTXO,SMD	1	Y1
....2	390-4762	VDUGLA at 47.628 MHz,VCXO SMD	1	U29
....2	390-5000	XTAL, OSC, 50MHZ, +3.3VDC, 50PPM	1	U39
....2	408-0901	CONN, SOCKET, 9 POS, 1 ROW, 2MM	4	J4, J5, J6, J7
....2	408-1000	HEADER,10-PIN,.100 CENTERS,DIP,note	2	J13, J16



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	413-1206	CHIP,TEST POINT,1206,SMD	21	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP21, TP22, TP23
....2	417-0262	MALE XLR, PANEL MOUNT	1	J26
....2	417-0265	CONN,BNC,JACK,THREADED,PC EDGE MOUNT,LOW PROFILE	3	J20, J23, J30
....2	417-0308	CONN,JACK,3-PIN,SMD	3	J14, J15, J18
....2	417-0331	CONN, 6 PIN, SMD	1	J28
....2	417-0700	CONN,PCB MT,2PIN	1	J27
....2	417-0903	RCPT, 9 PIN D, FEMALE	1	J21
....2	417-1403	CONN,HEADER 14PIN DOUBLE ROW	1	J9
....2	417-1517	CONN,HDR, 10-PIN SHROUDED PCB MT.	1	J3
....2	417-1701	STRAIGHT JACK RECEPTACLE,SMB PCB MOUNT 50 OHM	4	J19, J24, J25, J31
....2	417-5023	RCPT, 50 POS, 2 ROW, PCB, SAMTEC	2	J1, J2
....2	418-0000	CONN, HEADER, 80 POSITION, DOUBLE ROW, .8MM, EDGEMOUNT	1	J10
....2	418-1601	CONN,MALE,16-PIN,LATCH,PCB MT	1	J8
....2	418-2602-001	CONN,HEADER,26 PIN,LATCH/EJECT,PCB	1	J29
....2	519-0600	PCB MACH, EXGINE CARD	1	PCB1
....2	979-0545-007	KIT, SOFTWARE, CDROM, EXGINE, HDP-VX.XX	1	
.....3	579-0007	CD-CASE CLEAR PLASTIC	1	
.....3	597-0541-006	APPLICATION GUIDE, FXI 60/250 EXGINE FIRMWARE UPGRADE	1	
.....4	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	0.001	
.....3	701-0018	ANTISTATIC BAG ZIPLOC 9X12 4M	1	
.....3	979-0545-C07	CDROM, EXGINE, HDP-VX.XX	1	
.....4	579-0009	CD-R, BLANK, INKJET PRINTABLE	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....4	579-0600-401	SOFTWARE, EXGINE/NET BURNER, V4.01	1	
....2	979-0600-401	KIT,SW,NETBURNER,VX.XX,EXGINE	1	
.....3	579-0600-401	SOFTWARE, EXGINE/NET BURNER, V4.01	1	
.....3	959-0620	NETBURNER, MOD-5272	1	
....2	979-0600-S08	SOFTWARE,EXGINE,CPLD,U8	1	U8
.....3	224-9572	IC, CPDL, ZILINX XC9572	1	U8
....2	979-0600-U19	KIT,SW,FLASH MEMORY,U19,V1.0,EXGINE	1	U19
.....3	216-4008	IC, 4MB FLASH MEMORY SERIAL SOIC-8	1	U19
..1	949-0545	ASSY,CABLE,IBOC CARD,FXi60/250 (SBCM)	1	
....2	402-0051	TY-RAP, W/FLAG	2	
....2	417-1702	RIGHT ANGLE CRIMP TYPE PLUG,SMB,50 OHM	1	
....2	417-1703	Straight Crimp Type Plug,SMB,50 ohm	1	
....2	621-1359	CBL,COAX,RG316/U,50 OHM	1.5	
..1	949-0600-101	ASSY,CABLE,FM AES/EBU TO STL,FXi (SBCM)	1	
....2	608-1800	CBL,SHLD,AES/EBU,BELDEN 1800B (N)	10	
....2	611-0061	TUB,HT SHK CLEAR 3/64	0.166	
....2	829-4216	PLUG,FEM XLR, A3F (XLR-3-11C)	1	
....2	829-4217	PLUG,MALE XLR, A3M (XLR-3-12C)	1	
..1	949-0600-102	ASSY,CABLE,FM AES/EBU TO FM PRO,FXi (SBCM)	1	
....2	608-1800	CBL,SHLD,AES/EBU,BELDEN 1800B (N)	10	
....2	611-0061	TUB,HT SHK CLEAR 3/64	0.166	
....2	829-4216	PLUG,FEM XLR, A3F (XLR-3-11C)	1	
....2	829-4217	PLUG,MALE XLR, A3M (XLR-3-12C)	1	
..1	949-0600-103	ASSY,CABLE,FM AES/EBU,FXi TO XPi (SBCM)	1	
....2	608-1800	CBL,SHLD,AES/EBU,BELDEN 1800B (N)	3	
....2	611-0061	TUB,HT SHK CLEAR 3/64	0.166	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	829-4216	PLUG,FEM XLR, A3F (XLR-3-11C)	1	
....2	829-4217	PLUG,MALE XLR, A3M (XLR-3-12C)	1	
..1	949-0610	ASSY,CABLE,SERIAL TO EXGINE (SBCM)	1	
....2	417-0131	CONN,16 PIN 609-1630 ANSLEY	2	
....2	600-0016	CBL,FLAT,16-COND,28GA	0.5	
..1	949-0611	ASSY,CABLE,ETHERNET TO EXGINE (SBCM)	1	
....2	417-2814	PLUG, 8 POS ETHERNET 10BaseT	2	
....2	622-1245	CBL,ETHERNET,10BASET,CAT5	1	
..1	949-0612	ASSY,CABLE,I/O TO EXGINE	1	
....2	418-2600	CONN,26-PIN,RIBBON	2	
....2	600-0026	CBL,FLAT,26-COND,28GA	0.583	
..1	949-0613	ASSY,CABLE,10MHz IN/OUT,FXi/EXGINE (SBCM)	1	
....2	417-0094	CONN,BNC RG/U58 31-320 AMPH	2	
....2	622-0050	CBL,SH,50 OHM,RG-58/CU	2	
..1	959-0600	ASSY,SUB,EXGINE,ETHERNET & I/O	1	
....2	400-0600	STRIP,QUIET SHIELD,6.00x.197	2	
....2	418-1550-010	CONN, PLUG 10-PIN CAGE CLAMP 3.81MM SPACING	2	P4, P5
....2	420-0817	ASSY,FEMALE SCREWLOCK 205817-1	1	
....2	422-6107	SCREW,SEMS 6-32 X 7/16 PAN PH.ST."	6	
....2	441-2114	STOFF,ALUM 1/4HEX X 1 6-32	2	
....2	471-5369	FILLER,OPTIONS,ETHERNET,FXi60/250	1	
....2	919-0601	PCB, ASSY, EXGINE INPUT/OUTPUT	1	
.....3	417-1550-010	CONN, HEADER RT.ANGLE 10-PIN 3.81MM SPACING PCB MT	2	J4, J5
.....3	417-2609	CONN, HDR, 26 PIN, R. ANGLE SHROUDED	1	J29
.....3	421-6908	SHEET EDGE CONNECTOR 6-32	1	
.....3	519-0601	PCB, MACH, EXGINE INPUT/OUTPUT	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
....2	919-0602	PCB, ASSY, FXI ETHERNET	1	
.....3	417-0189	CONN,9PIN MALE,RTANG,PCB MT	1	J2
.....3	417-0267	CONN,RJ-45,8 PIN,R.ANGLE MODULAR JACK,SHIELDED,LOW PROFILE	1	J1
.....3	417-1100	CONN, RJ11, FILTERED, PCB MOUNT	1	J4
.....3	417-1609	CONN, HDR, 16 PIN, R. ANGLE SHROUDED	1	J8
.....3	417-7188	CONN,RJ-45 JACK SINGLE PORT 8-PIN SHIELDED PCB MOUNT	1	J3
.....3	420-4106	SCREW,4-40X.375,S.S. PH	2	
.....3	421-4001	4-40 S.S. HEX NUT	2	
.....3	421-6908	SHEET EDGE CONNECTOR 6-32	1	
.....3	423-4002	#4 LOCK S.S. SPLIT	2	
.....3	519-0602	PCB, MACH, FXI ETHERNET	1	
..1	979-0541-013	KIT,SOFTWARE,FXi,CONTROLLER,V2.0.41	1	
....2	579-0007	CD-CASE CLEAR PLASTIC	1	
....2	597-0541-005	APPLICATION GUIDE, FXI 60/250 SOFTWARE UPDATE, V02.xx.41	1	
.....3	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	0.001	
....2	701-0018	ANTISTATIC BAG ZIPLOC 9X12 4M	1	
....2	979-0541-C13	SOFTWARE,CD,FXi,CONTROLLER,V2.0.41	1	
.....3	579-0009	CD-R, BLANK, INKJET PRINTABLE	1	
..1	979-0545-007	KIT, SOFTWARE, CDROM, EXGINE, HDP-VX.XX	1	
....2	579-0007	CD-CASE CLEAR PLASTIC	1	
....2	597-0541-006	APPLICATION GUIDE, FXI 60/250 EXGINE FIRMWARE UPGRADE	1	
.....3	594-9999	PAPER,COPIER 8 1/2 X 11,20LB HI-TEC	0.001	
....2	701-0018	ANTISTATIC BAG ZIPLOC 9X12 4M	1	
....2	979-0545-C07	CDROM, EXGINE, HDP-VX.XX	1	
.....3	579-0009	CD-R, BLANK, INKJET PRINTABLE	1	



BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
.....3	579-0600-401	SOFTWARE, EXGINE/NET BURNER, V4.01	1	

7 RF TECHNICAL SERVICES CONTACT INFORMATION

RF Technical Services -

Telephone: **(217) 224-9617**

E-Mail: rfservice@bdcast.com

Fax: **(217) 224-6528**

web: www.bdcast.com

8 DRAWINGS

The following pages present the FXi Exciter drawings.

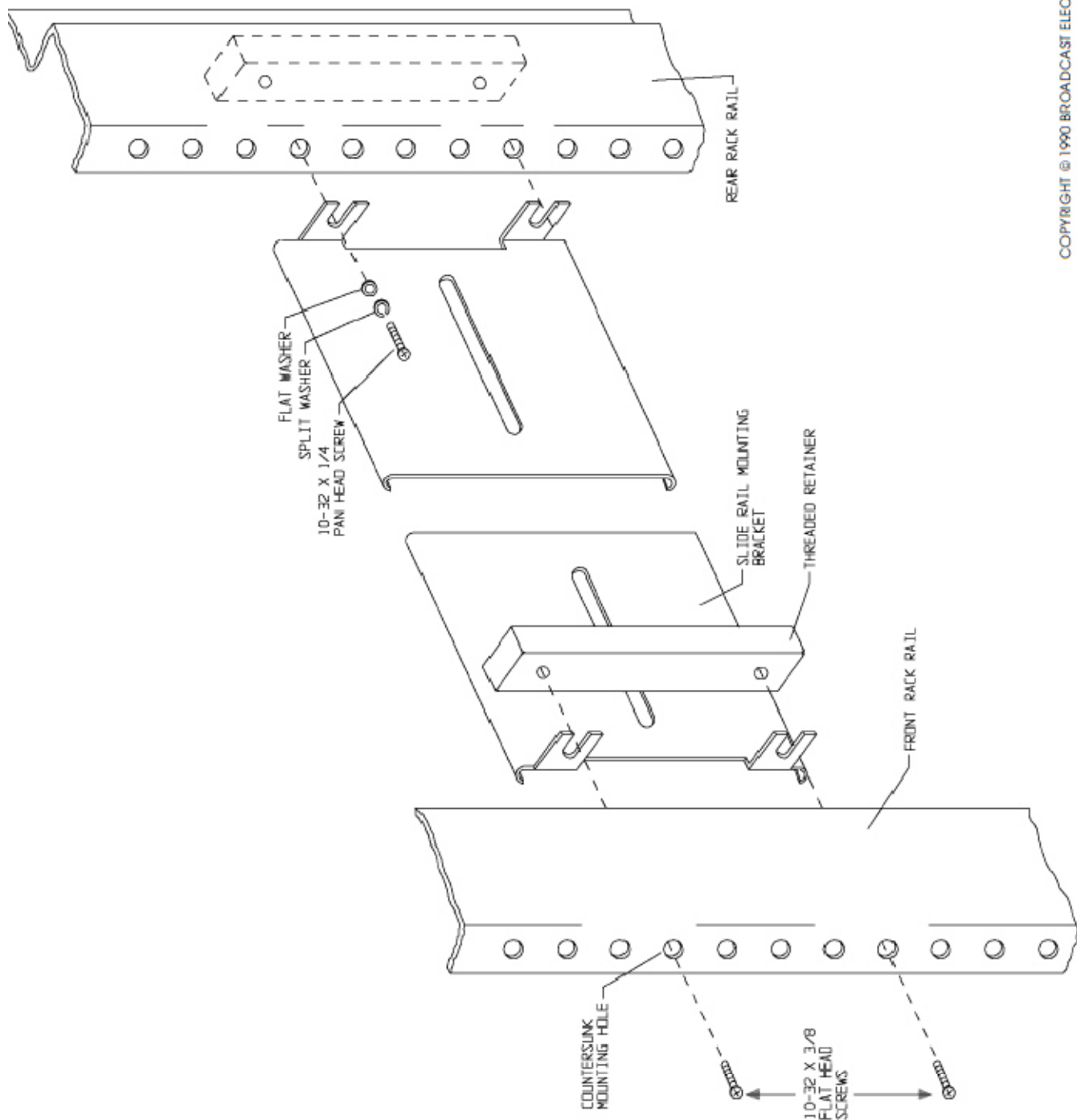
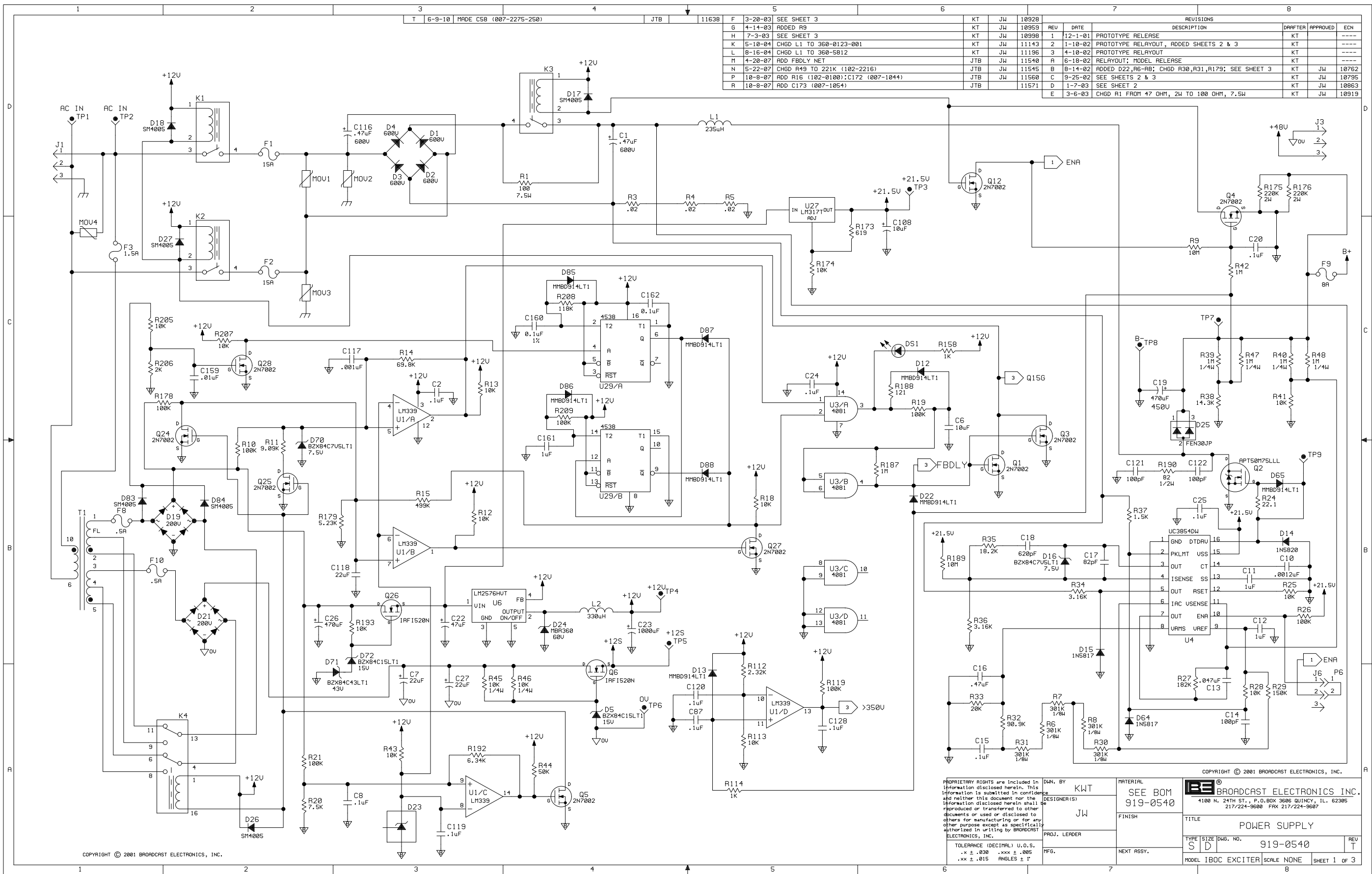
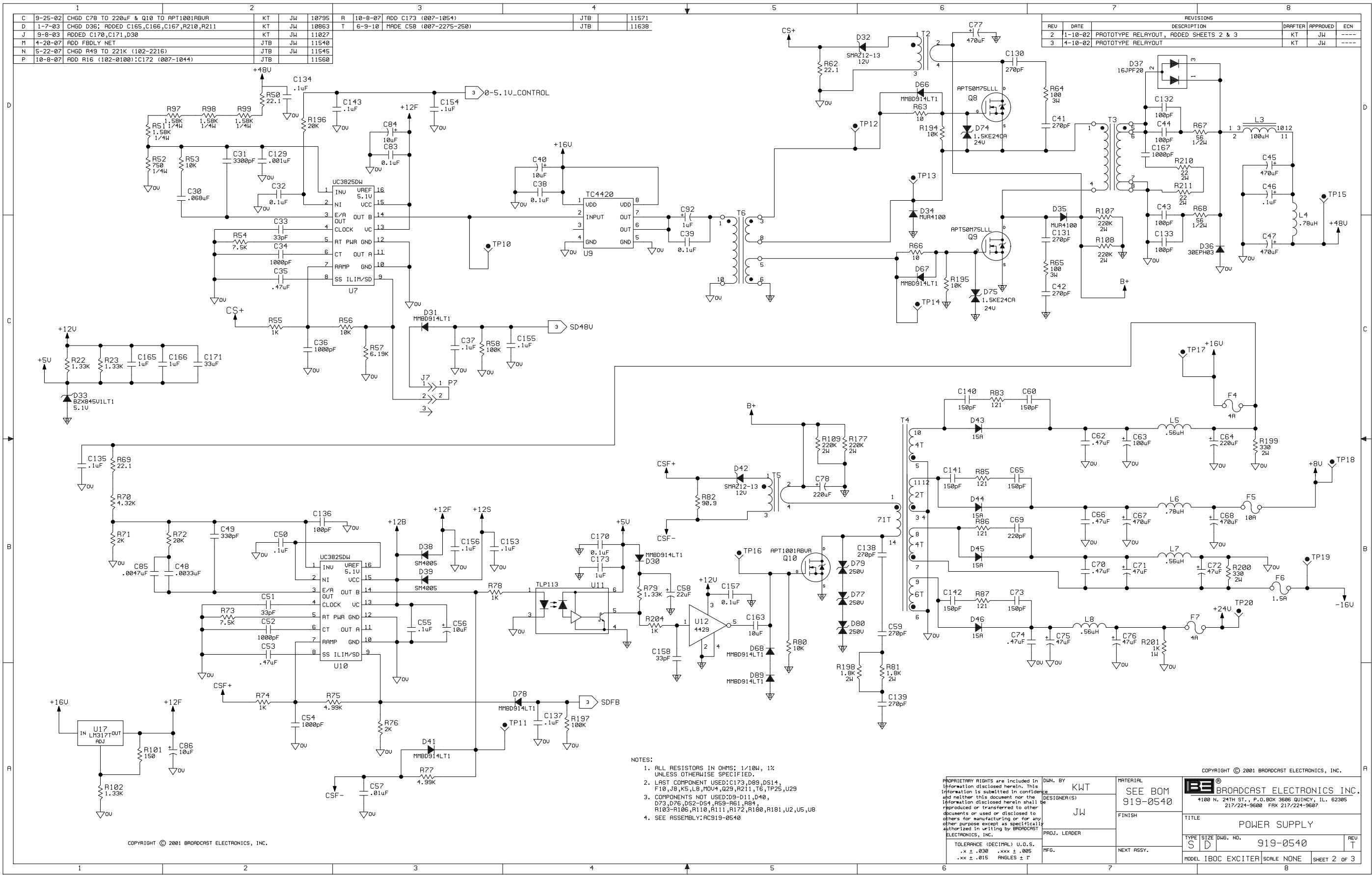
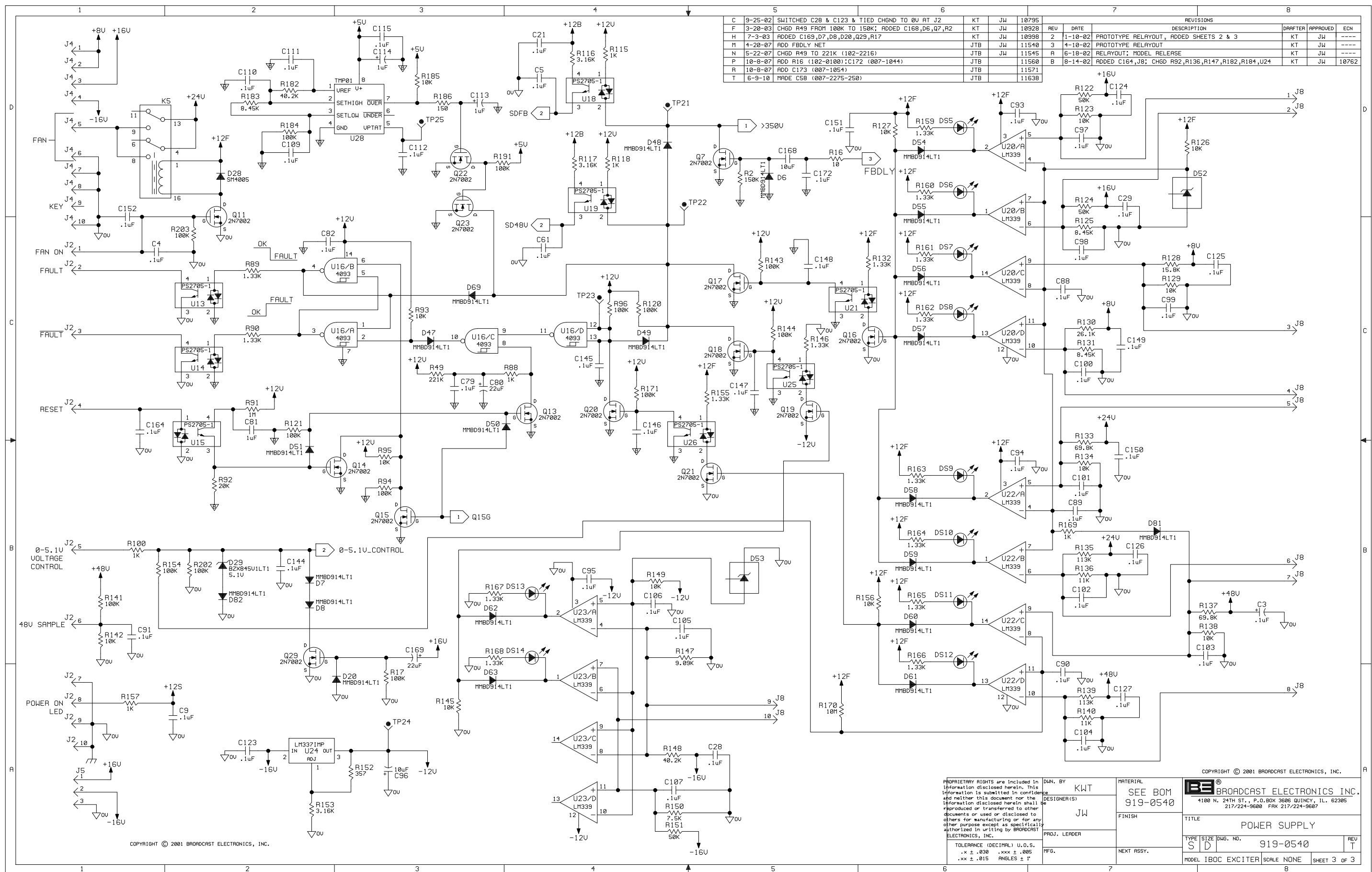
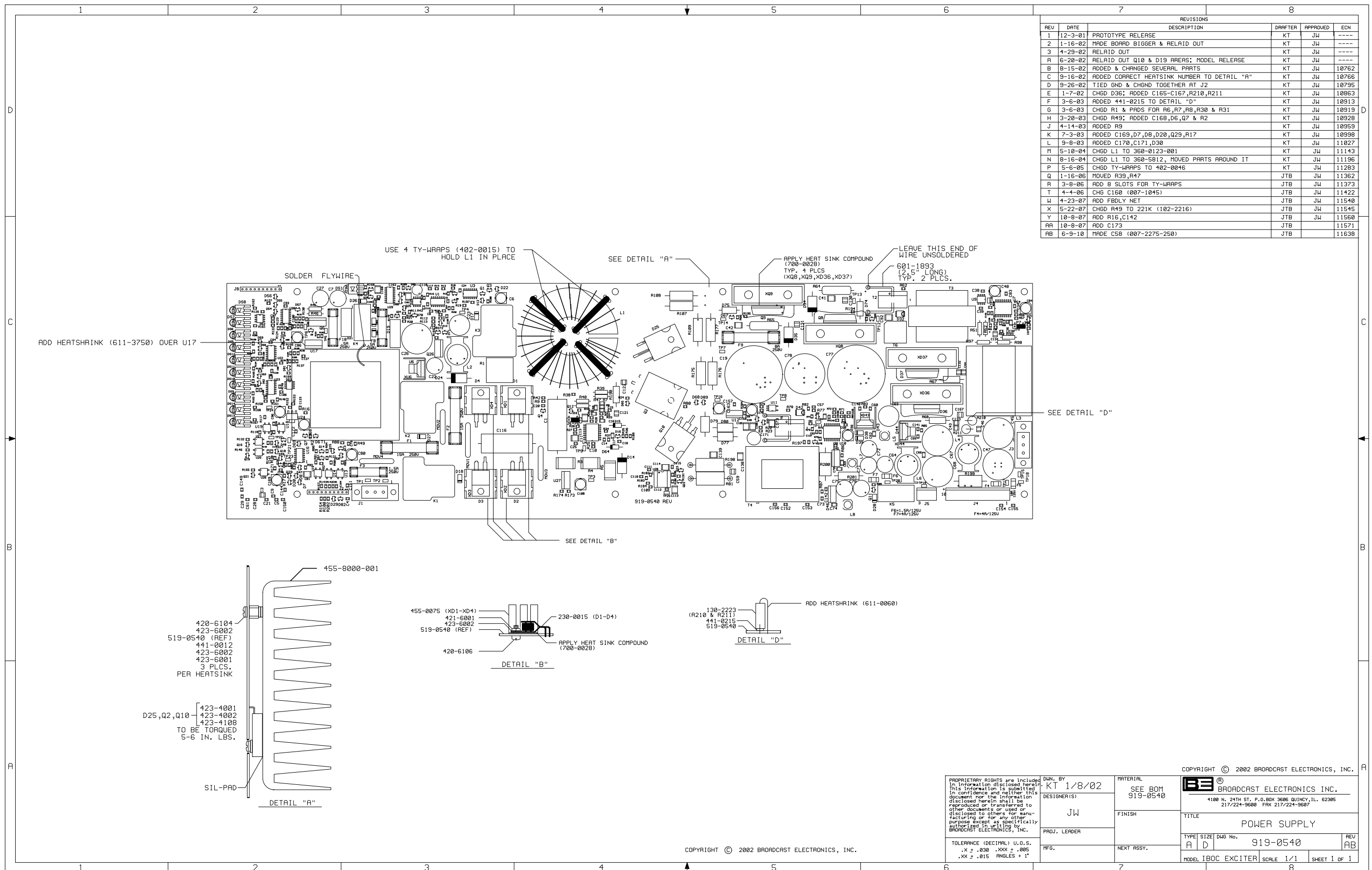


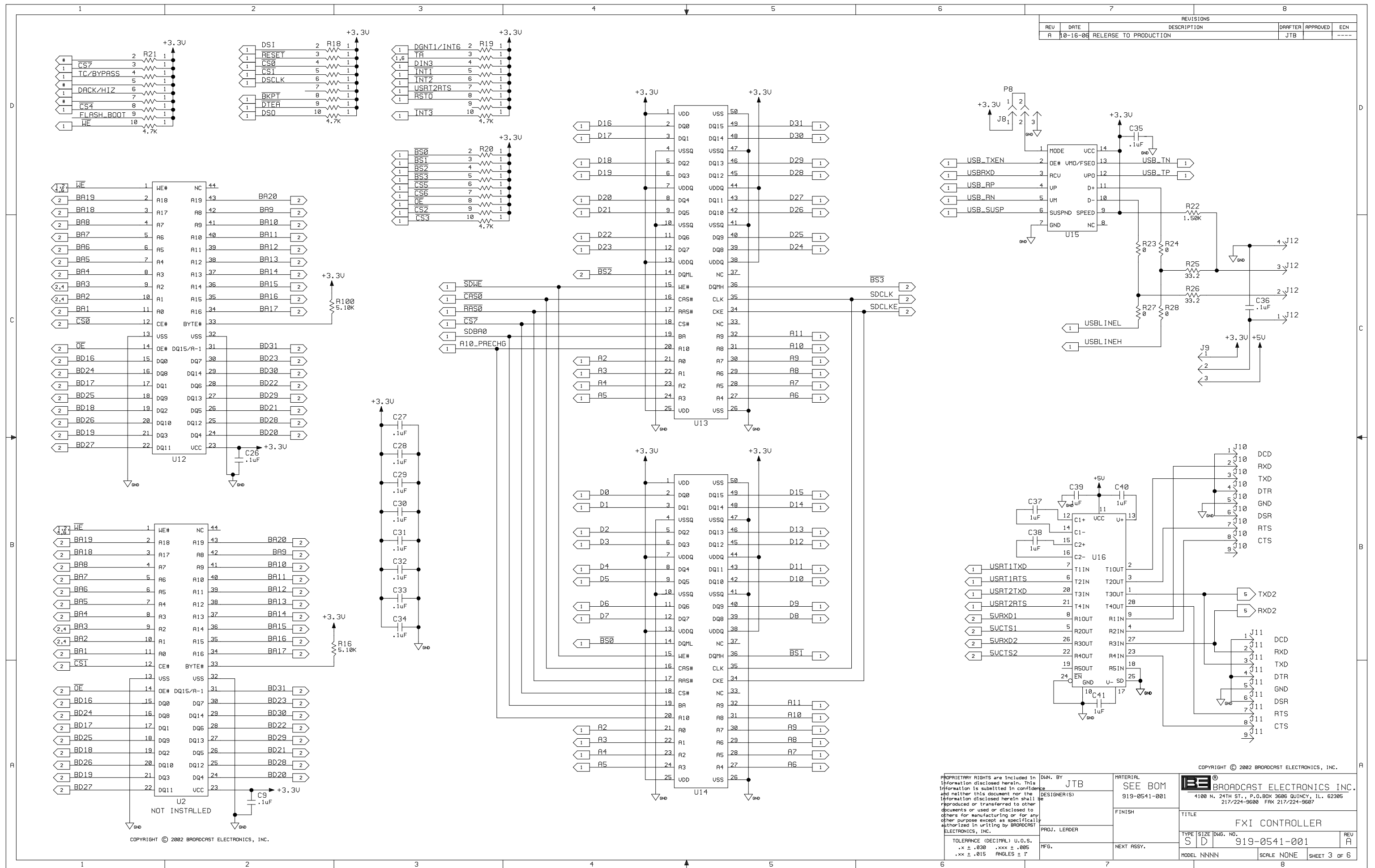
Figure 8-1. IPA UNIT FRONT RAIL MOUNTING APPLICATIONS

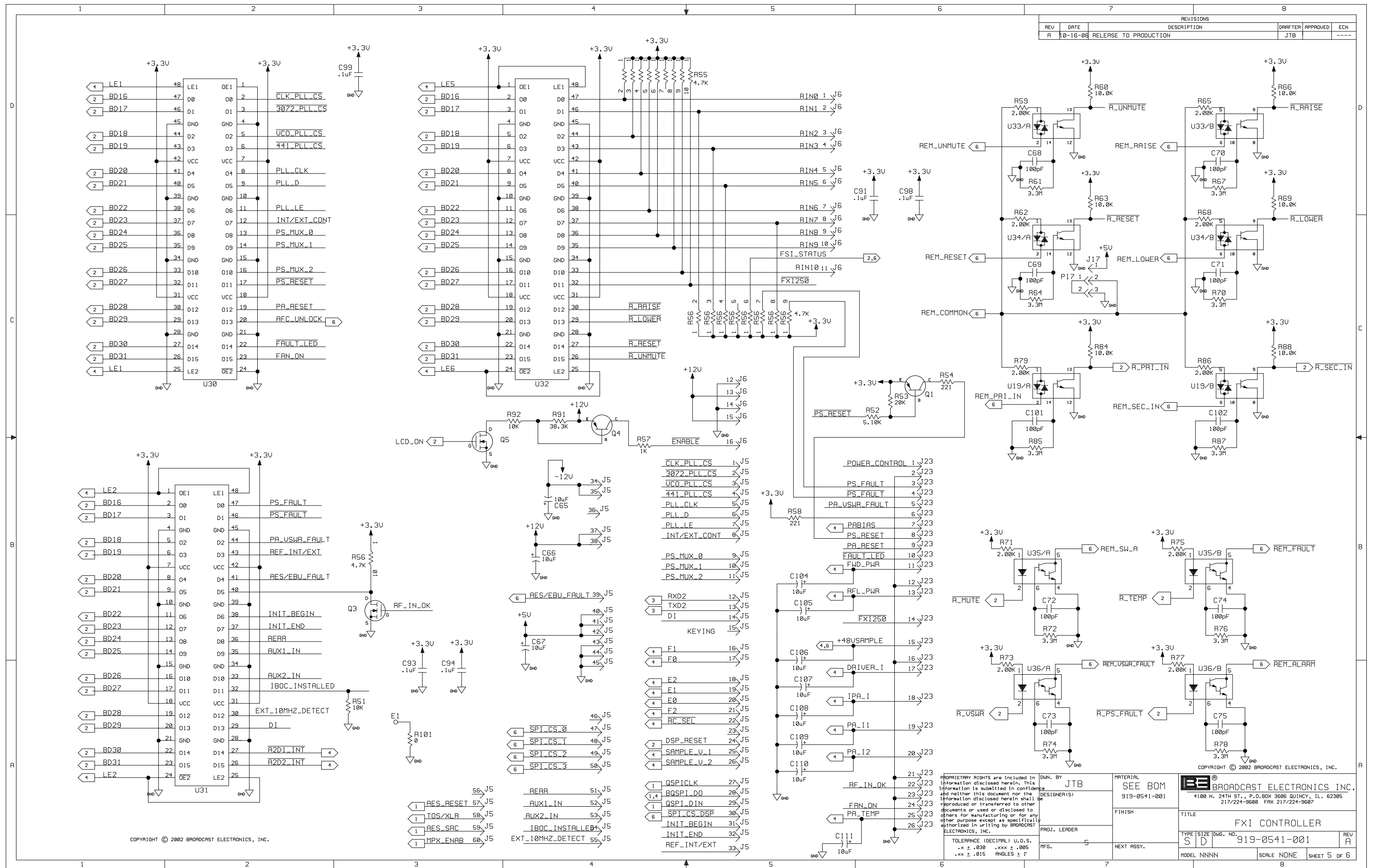


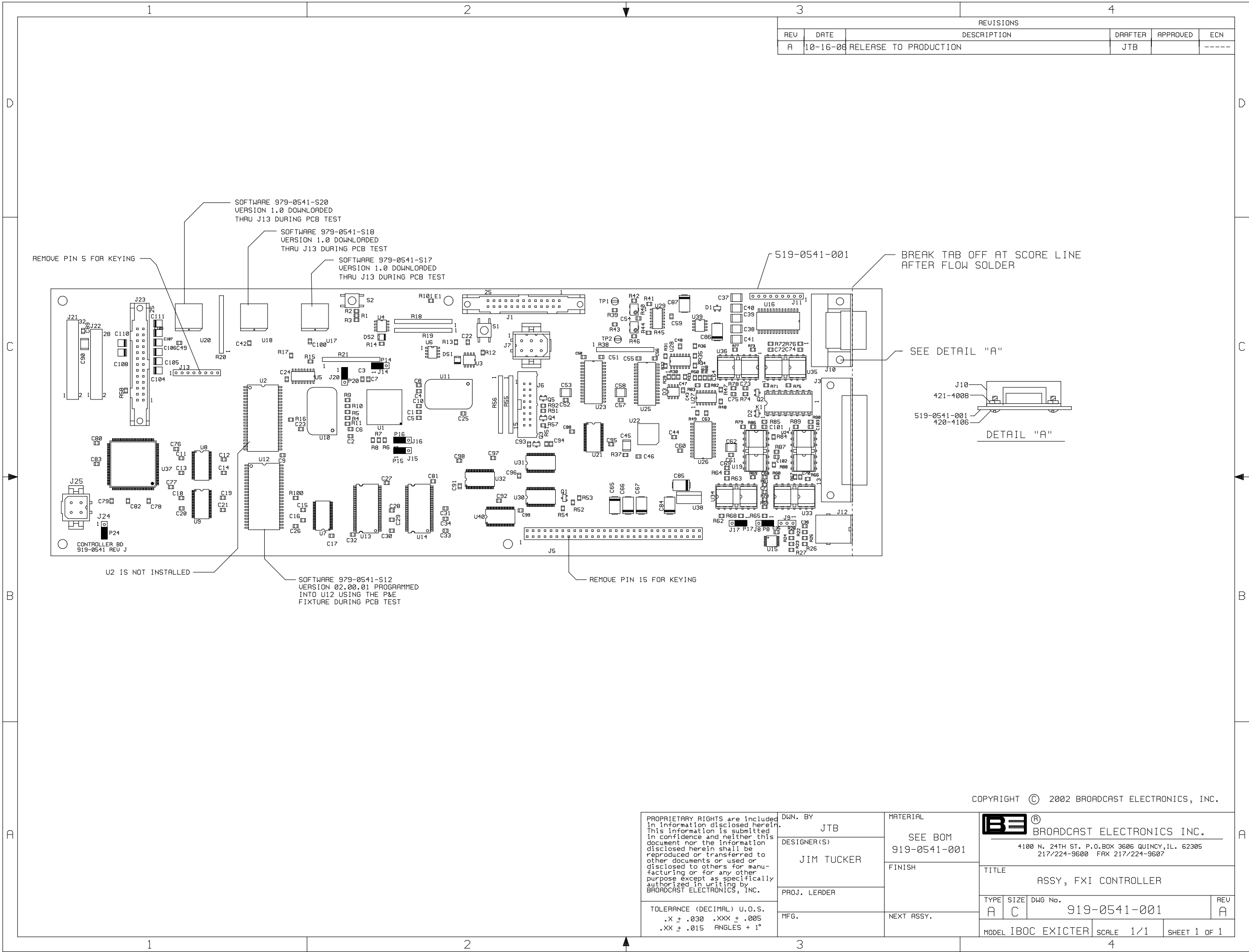









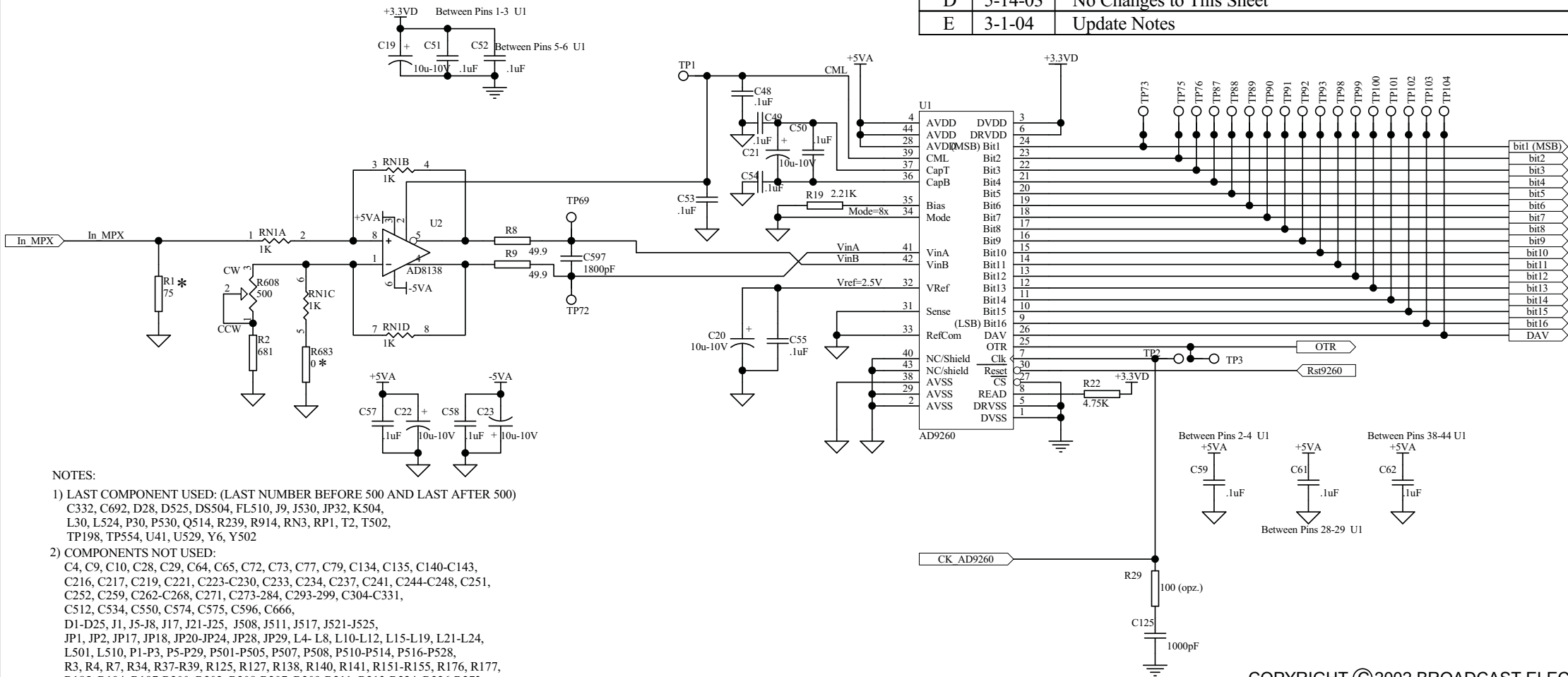




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	JTB							
	DESIGNER(S)	SEE BOM 919-0541-001	FINISH	TITLE ASSY, FXI CONTROLLER	TYPE A	SIZE C	DWG No. 919-0541-001	REV A
	JIM TUCKER							
	PROJ. LEADER	NEXT ASSY.						
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES ± 1°	MFG.							

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	Add Notes	EG		10821
C	2-4-03	Change R608, R2 Values; Make R683 Not Placed; Update Notes	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	Update Notes	EG		11111

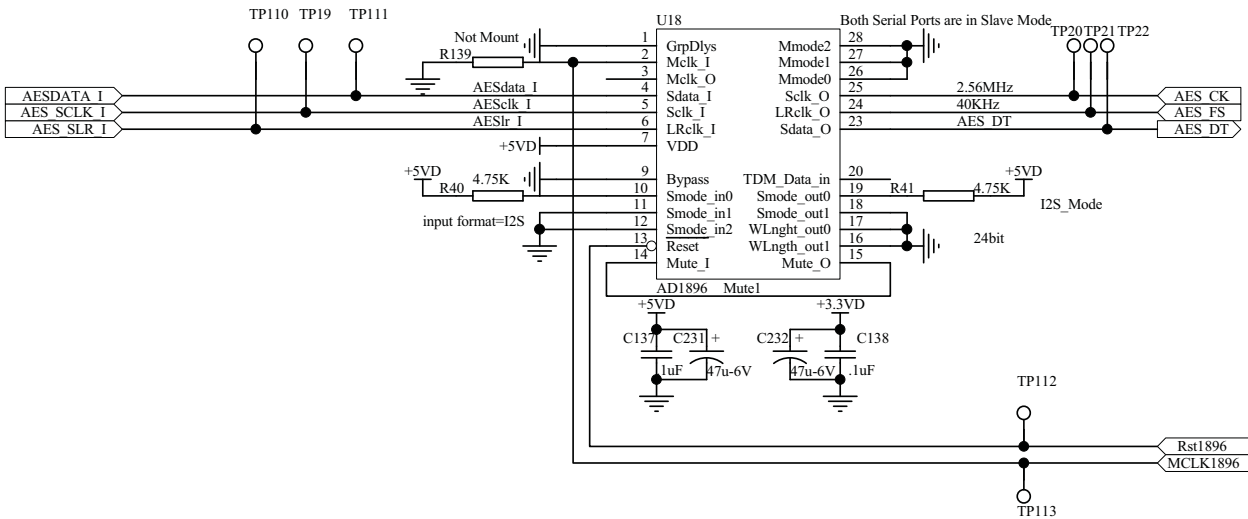


- NOTES:
- 1) LAST COMPONENT USED: (LAST NUMBER BEFORE 500 AND LAST AFTER 500)
C332, C692, D28, D525, DS504, FL510, J9, J530, JP32, K504, L30, L524, P30, P530, Q514, R239, R914, RN3, RP1, T2, T502, TP198, TP554, U41, U529, Y6, Y502
- 2) COMPONENTS NOT USED:
C4, C9, C10, C28, C29, C64, C65, C72, C73, C77, C79, C134, C135, C140-C143, C216, C217, C219, C221, C223-C230, C233, C234, C237, C241, C244-C248, C251, C252, C259, C262-C268, C271, C273-284, C293-299, C304-C331, C512, C534, C550, C574, C575, C596, C666, D1-D25, J1, J5-J8, J17, J21-J25, J508, J511, J517, J521-J525, JP1, JP2, JP17, JP18, JP20-JP24, JP28, JP29, L4- L8, L10-L12, L15-L19, L21-L24, L501, L510, P1-P3, P5-P29, P501-P505, P507, P508, P510-P514, P516-P528, R3, R4, R7, R34, R37-R39, R125, R127, R138, R140, R141, R151-R155, R176, R177, R185, R194, R197-R200, R202, R208-R207, R209-R211, R213-R224, R226-R273, R591, R658, R664, R665, R667, R679, R680, R684-R688, R698, R705-R899, TP18, TP74, TP77, TP94, TP175-TP177, U15-17, U19, U20, U28, U31-U36, U40, U514, U518, Y1-Y5, Y501
- 3) COMPONENTS NOT PLACED: (* INDICATES PARTS NOT PLACED)
Q514, R1, R6, R30, R31, R33, R36, R97, R98, R135, R139, R142, R143, R144, R146, R148, R149, R150, R156-R159, R167, R168, R170, R171, R173, R174, R176, R177, R178, R179, R196, R550, R601, R607, R619, R628, R630, R683, R699, R702, R704.


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	DESIGNER \$		FINISH	TITLE COMPOSITE INTERFACE			
	PROJ. LEADER	TYPE		SIZE	DWG. NO.	REV	
	MFG.	NEXT ASSY.		S	B	919-0542	E
TOLERANCE (DECIMAL) U.O.S. .x + .030 .xxx + .005 - ° .xx + .015 ANGLES + 1 - °			MODEL		SCALE	NONE	SHEET 2 OF 18

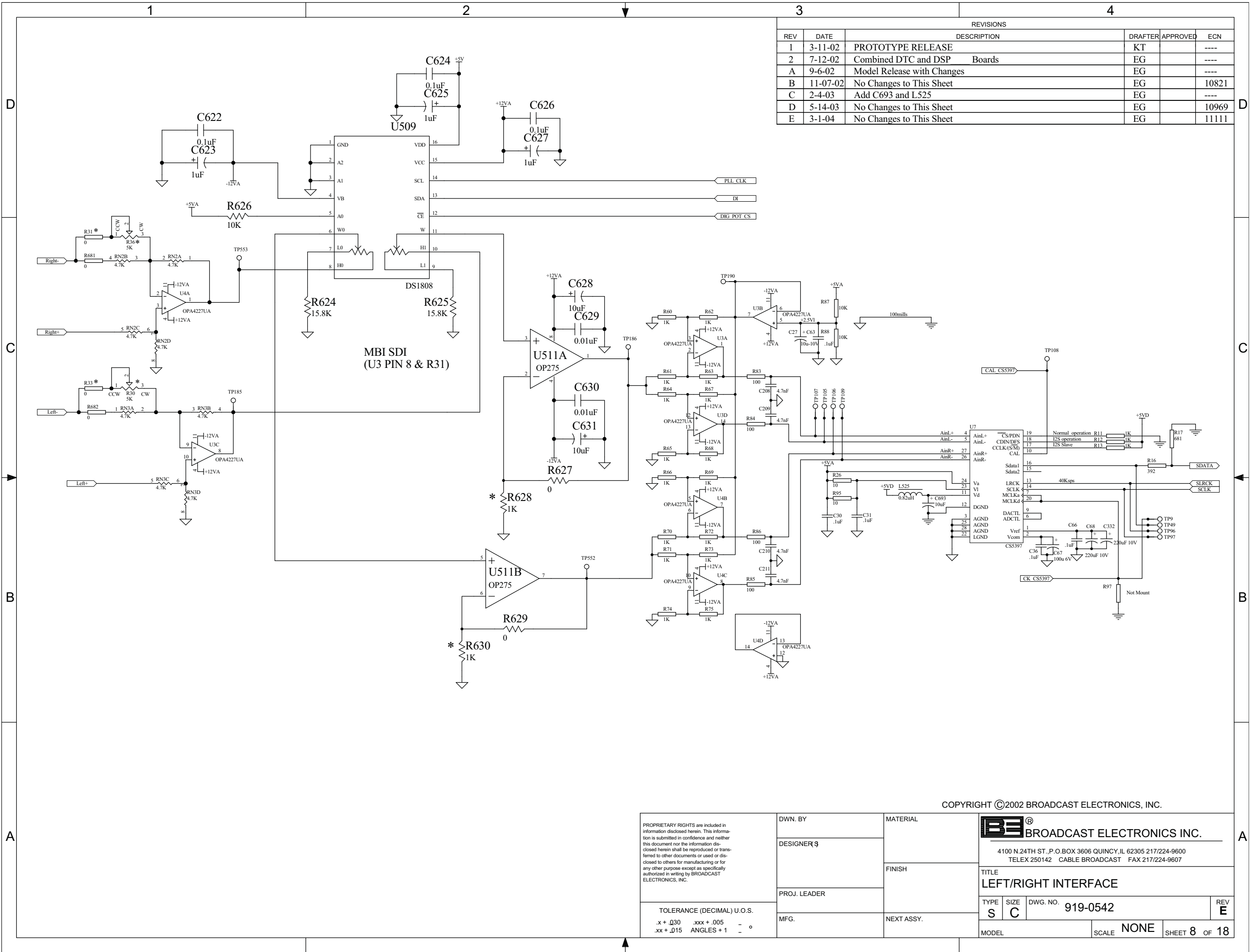
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REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	No Changes to This Sheet	EG		10821
C	2-4-03	No Changes to This Sheet	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	No Changes to This Sheet	EG		11111




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	DESIGNER \$		TITLE AES INPUT & OPTICAL RECEIVER INTERFACE				
	PROJ. LEADER	FINISH					TYPE
	MFG.		NEXT ASSY.	S	B	919-0542	E
TOLERANCE (DECIMAL) U.O.S. .x + .Q30 .xxx + .005 - .xx + .015 ANGLES + 1 - °			MODEL		SCALE	NONE	SHEET 7 OF 18

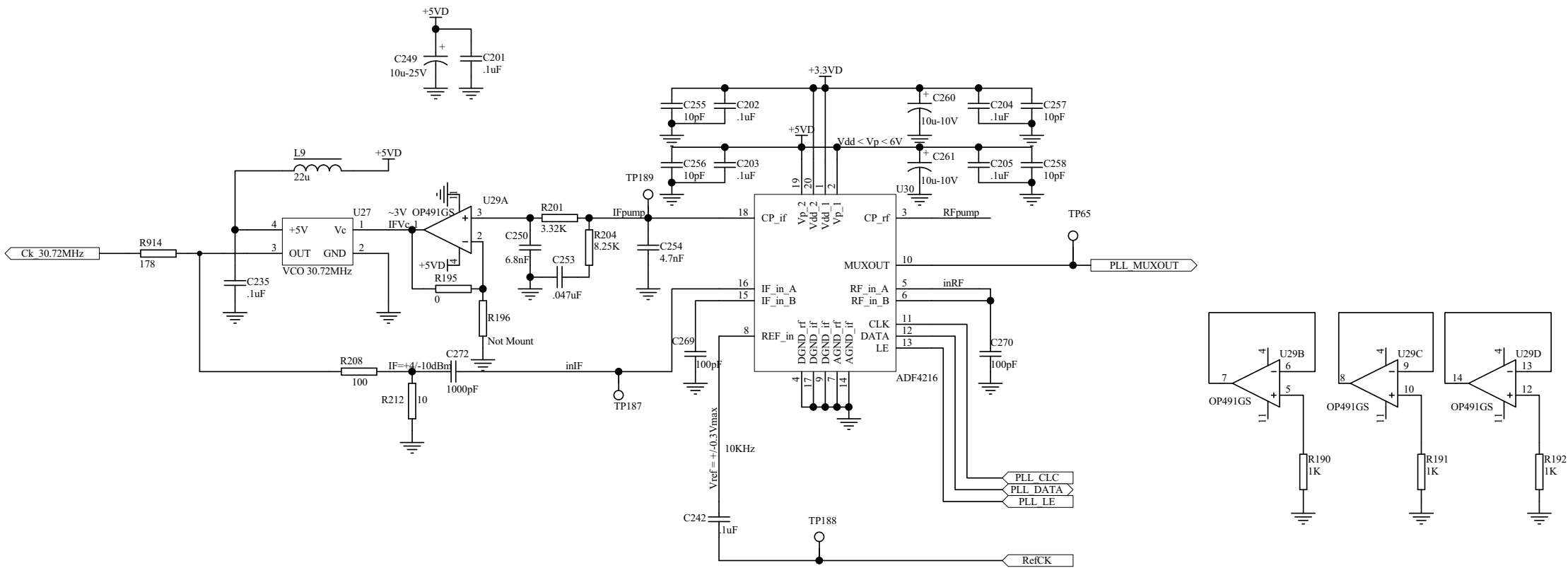


REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	No Changes to This Sheet	EG		10821
C	2-4-03	Add C693 and L525	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	No Changes to This Sheet	EG		11111

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	DESIGNER'S		TITLE LEFT/RIGHT INTERFACE				
	PROJ. LEADER	FINISH					
	TOLERANCE (DECIMAL) U.O.S. .x + .030 .xxx + .005 - ° .xx + .015 ANGLES + 1 - °	MFG.	NEXT ASSY.	TYPE S	SIZE C	DWG. NO. 919-0542	REV E
			MODEL		SCALE NONE	SHEET 8 OF 18	

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	No Changes to This Sheet	EG		10821
C	2-4-03	No Changes to This Sheet	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	Add R914; Change R208, R212; Move L9 to +5VD	EG		11111



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	DESIGNER \$		FINISH	TITLE 30.72MHz CLOCK		
	PROJ. LEADER	TYPE		SIZE	DWG. NO.	REV
	MFG.	NEXT ASSY.		S	B	919-0542
TOLERANCE (DECIMAL) U.O.S. .x + .030 .xxx + .005 - ° .xx + .015 ANGLES + 1 - °		MODEL		SCALE	NONE	SHEET 9 OF 18




REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	Move P4 Over Pins 2&3 of J4	EG		10821
C	2-4-03	No Changes to This Sheet	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	No Changes to This Sheet	EG		11111

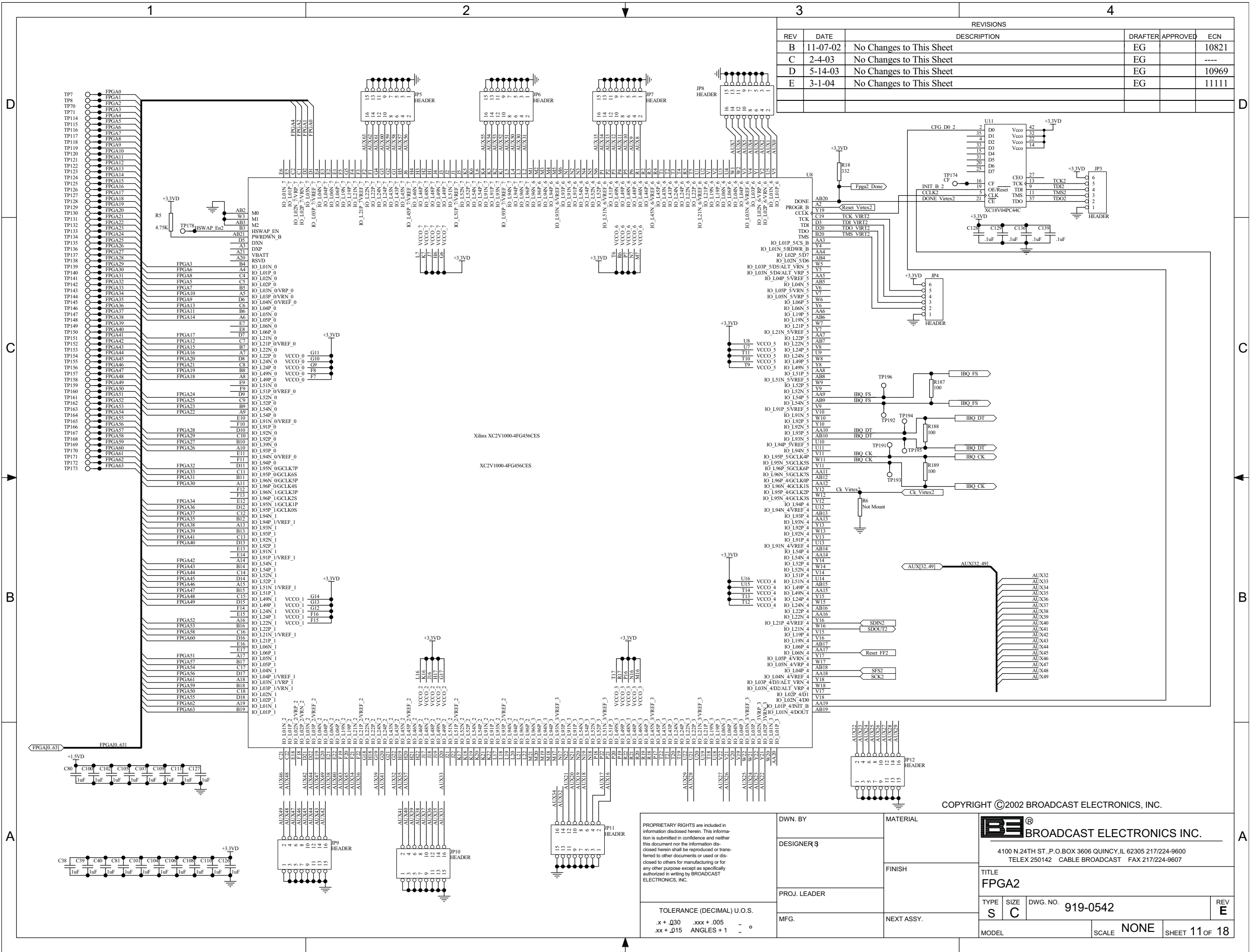
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TOLERANCE (DECIMAL) U.O.S.

DWN. BY
DESIGNER \$
PROJ. LEADER
MFG.

MATERIAL	
FINISH	
NEXT ASSY.	

 BROADCAST ELECTRONICS INC.			
4100 N.24TH ST.,P.O.BOX 3606 QUINCY,IL 62305 217/224-9600 TELEX 250142 CABLE BROADCAST FAX 217/224-9607			
TITLE DIGITAL TO ANALOG CONVERSION			
TYPE S	SIZE B	DWG. NO. 919-0542	REV E
MODEL		SCALE NONE	SHEET 10 OF 18



REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
B	11-07-02	No Changes to This Sheet	EG		10821
C	2-4-03	No Changes to This Sheet	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	No Changes to This Sheet	EG		11111

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TOLERANCE (DECIMAL) U.O.S.	
.x + .Q30	.xxx + .005
.xx + .D15	ANGLES + 1

DWN. BY		MATERIAL	
DESIGNER'S		FINISH	
PROJ. LEADER		NEXT ASSY.	
MFG.		SCALE	
		SHEET 11 OF 18	

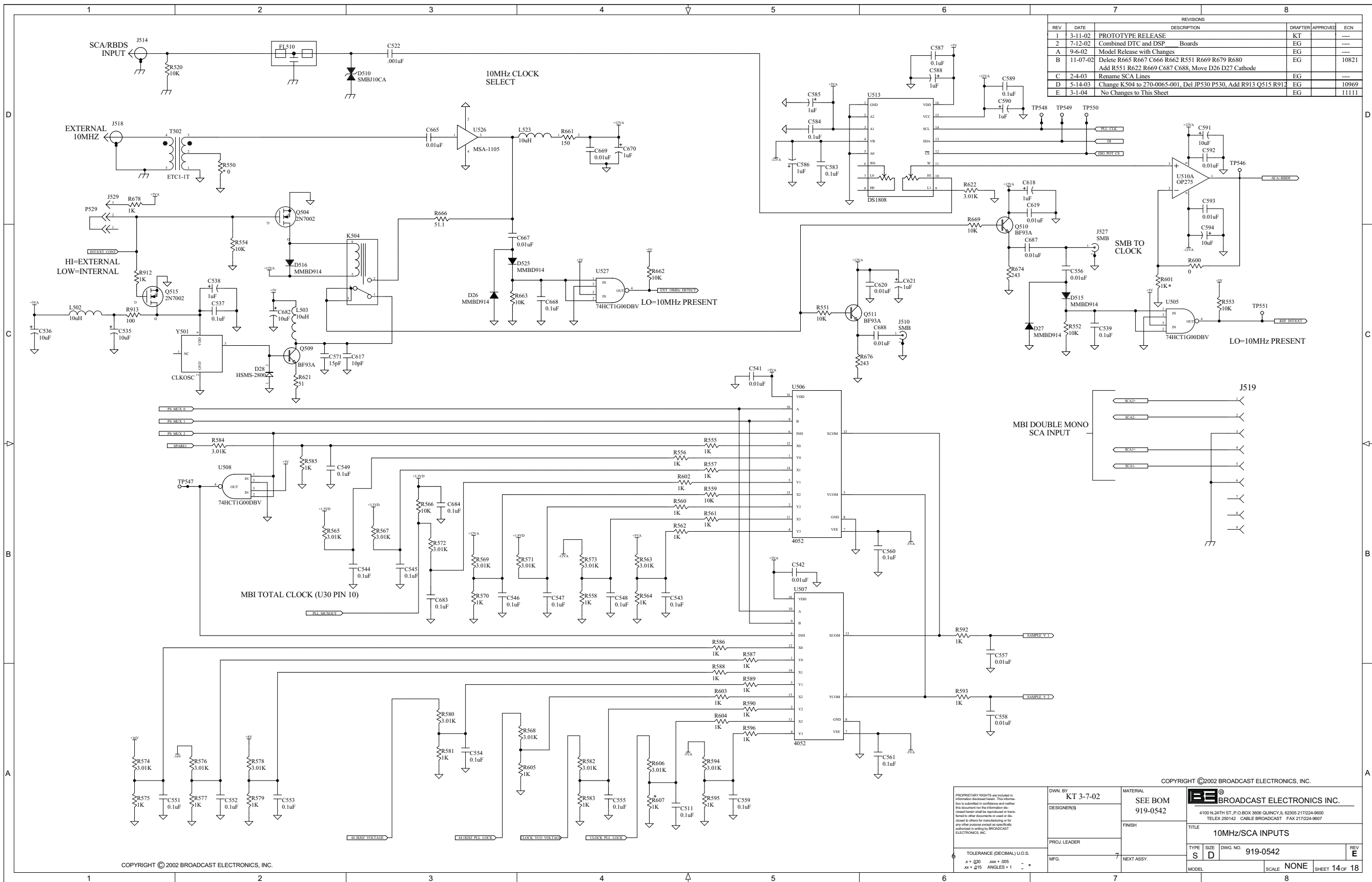


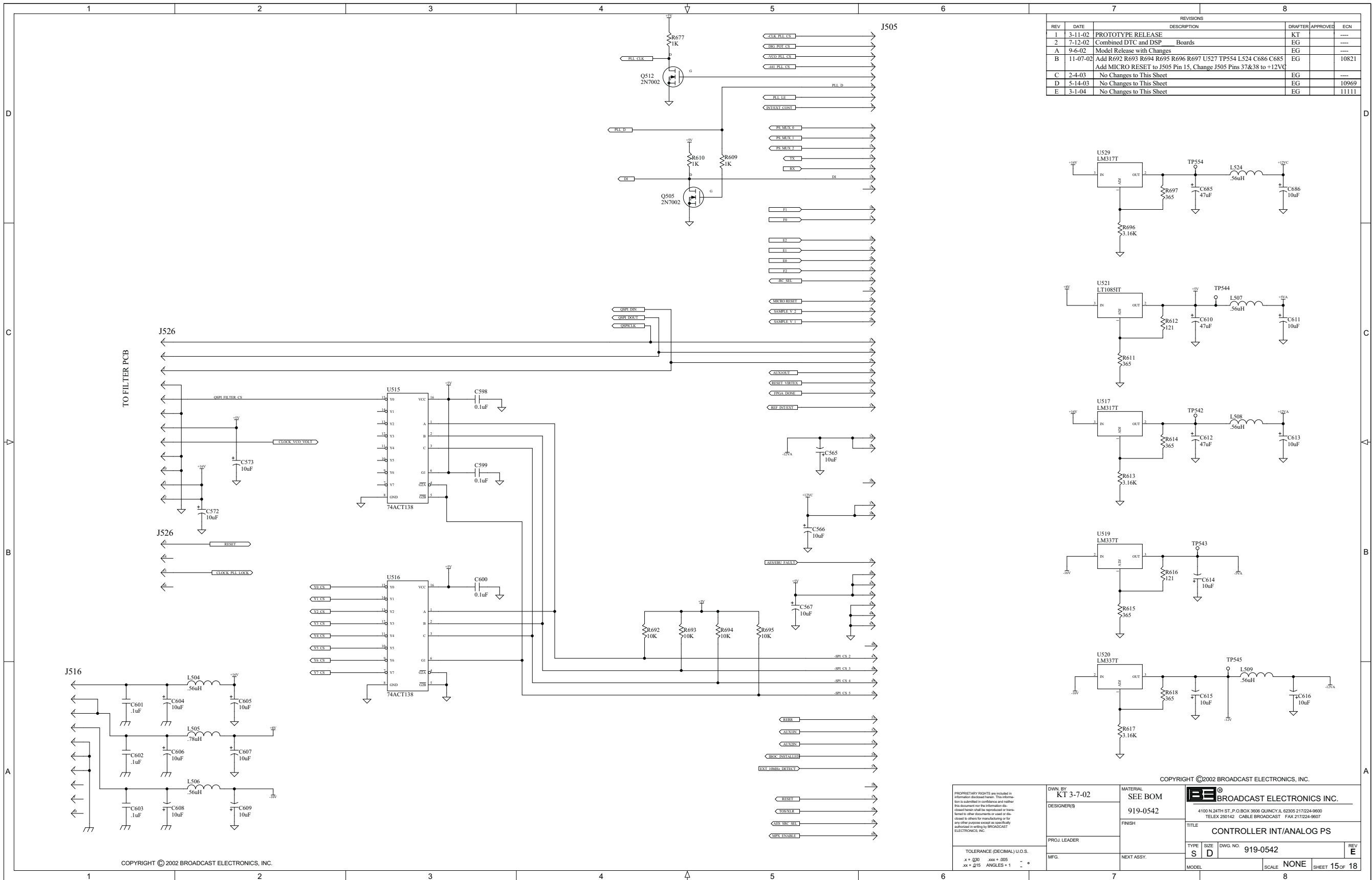
4100 N.24TH ST., P.O. BOX 3606 QUINCY, IL 62305 217/224-9600
TELEX 250142 CABLE BROADCAST FAX 217/224-9607

TITLE
FPGA2

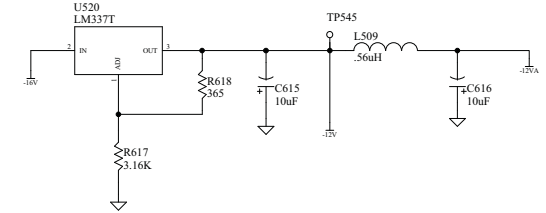
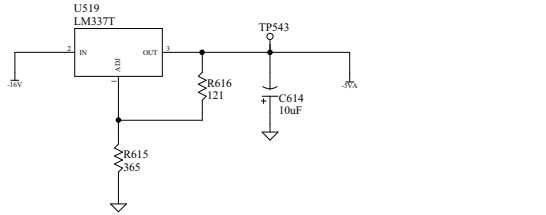
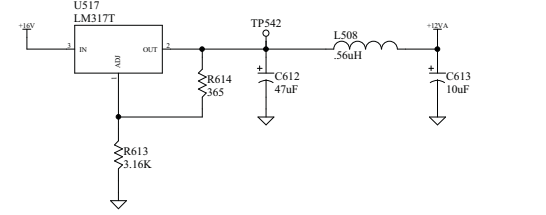
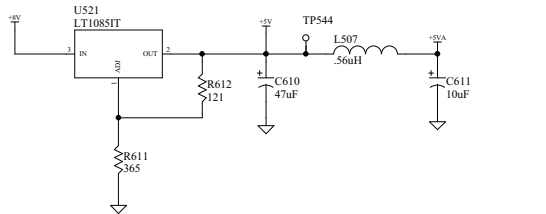
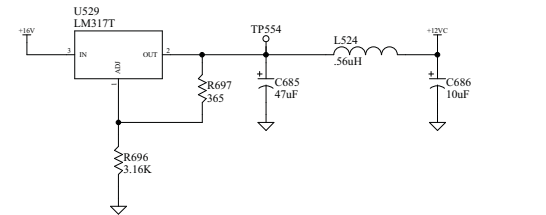
TYPE S SIZE C DWG. NO. 919-0542

MODEL

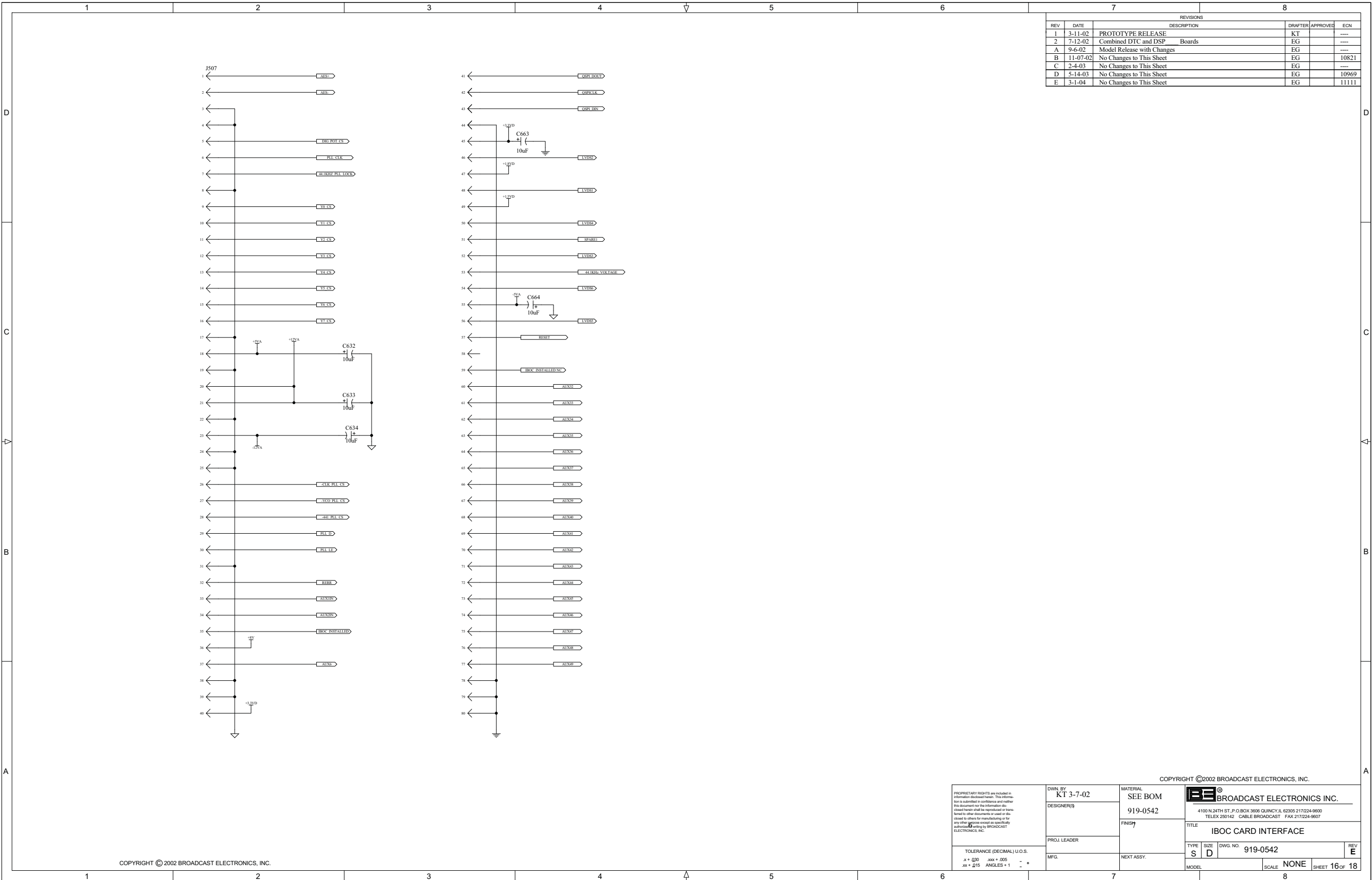




REVISIONS				
REV	DATE	DESCRIPTION	DRAFTER	APPROVED
1	3-11-02	PROTOTYPE RELEASE	KT	----
2	7-12-02	Combined DTC and DSP Boards	EG	----
A	9-6-02	Model Release with Changes	EG	----
B	11-07-02	Add R692 R693 R694 R695 R696 R697 U527 TP554 L524 C686 C685 Add MICRO RESET to J505 Pin 15, Change J505 Pins 37&38 to +12V	EG	10821
C	2-4-03	No Changes to This Sheet	EG	----
D	5-14-03	No Changes to This Sheet	EG	10969
E	3-1-04	No Changes to This Sheet	EG	11111



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TOLERANCE (DECIMAL) U.O.S. x + .030 - .005 xx + .015 - .005		PROJ. LEADER	TITLE: CONTROLLER INT/ANALOG PS		REV E
MFG.		NEXT ASSY:	TYPE S SIZE D	DWG. NO. 919-0542	SCALE NONE
			MODEL	SHEET 15 OF 18	



REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVER	ECN
1	3-11-02	PROTOTYPE RELEASE	KT		----
2	7-12-02	Combined DTC and DSP Boards	EG		----
A	9-6-02	Model Release with Changes	EG		----
B	11-07-02	No Changes to This Sheet	EG		10821
C	2-4-03	No Changes to This Sheet	EG		----
D	5-14-03	No Changes to This Sheet	EG		10969
E	3-1-04	No Changes to This Sheet	EG		11111

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DWN. BY:
KT 3-7-02

DESIGNER(S)

PROJ. LEADER

MFQ.

MATERIAL:
SEE BOM

919-0542

FINISH

NEXT ASSY.

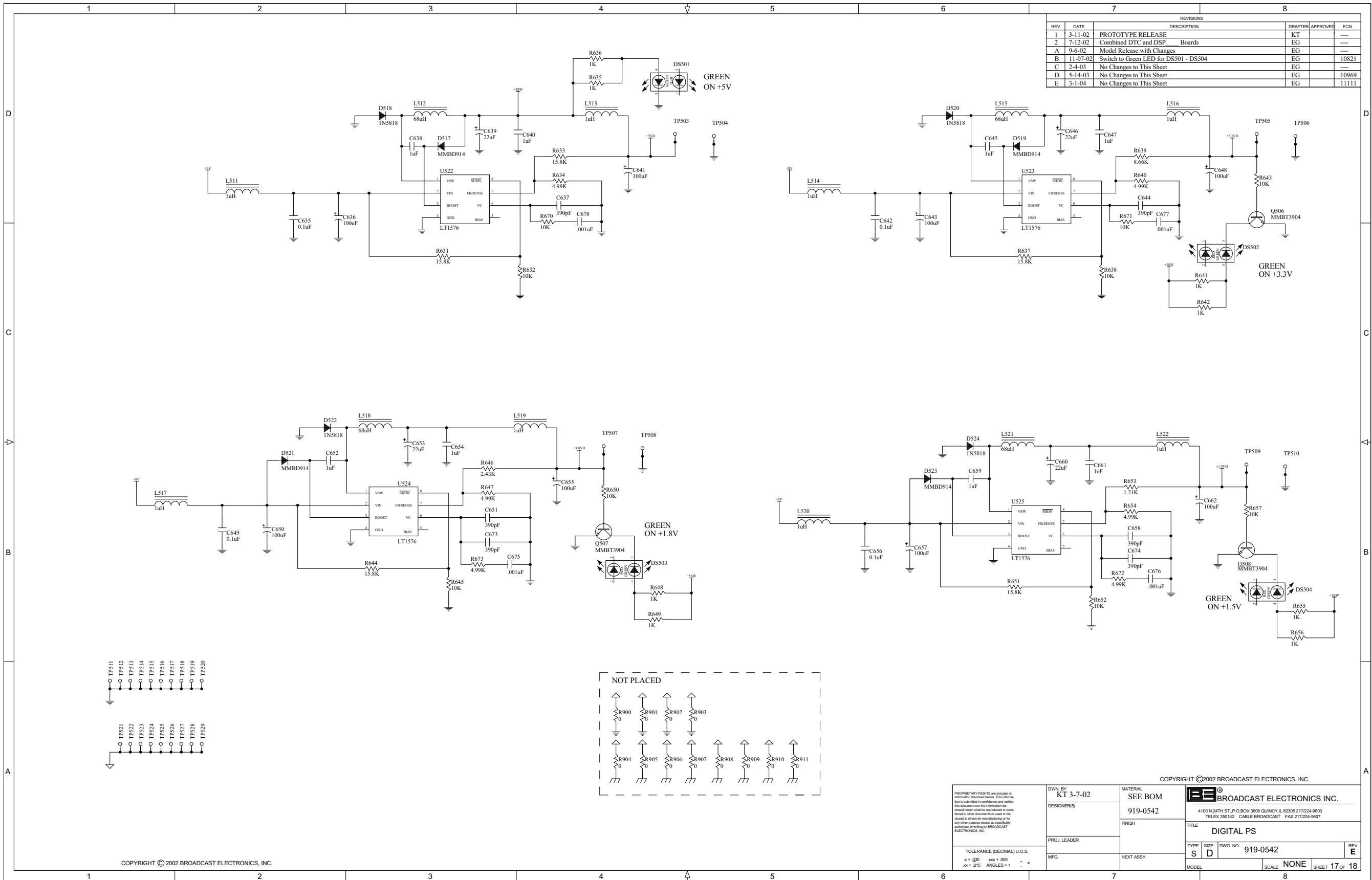
BROADCAST ELECTRONICS, INC.

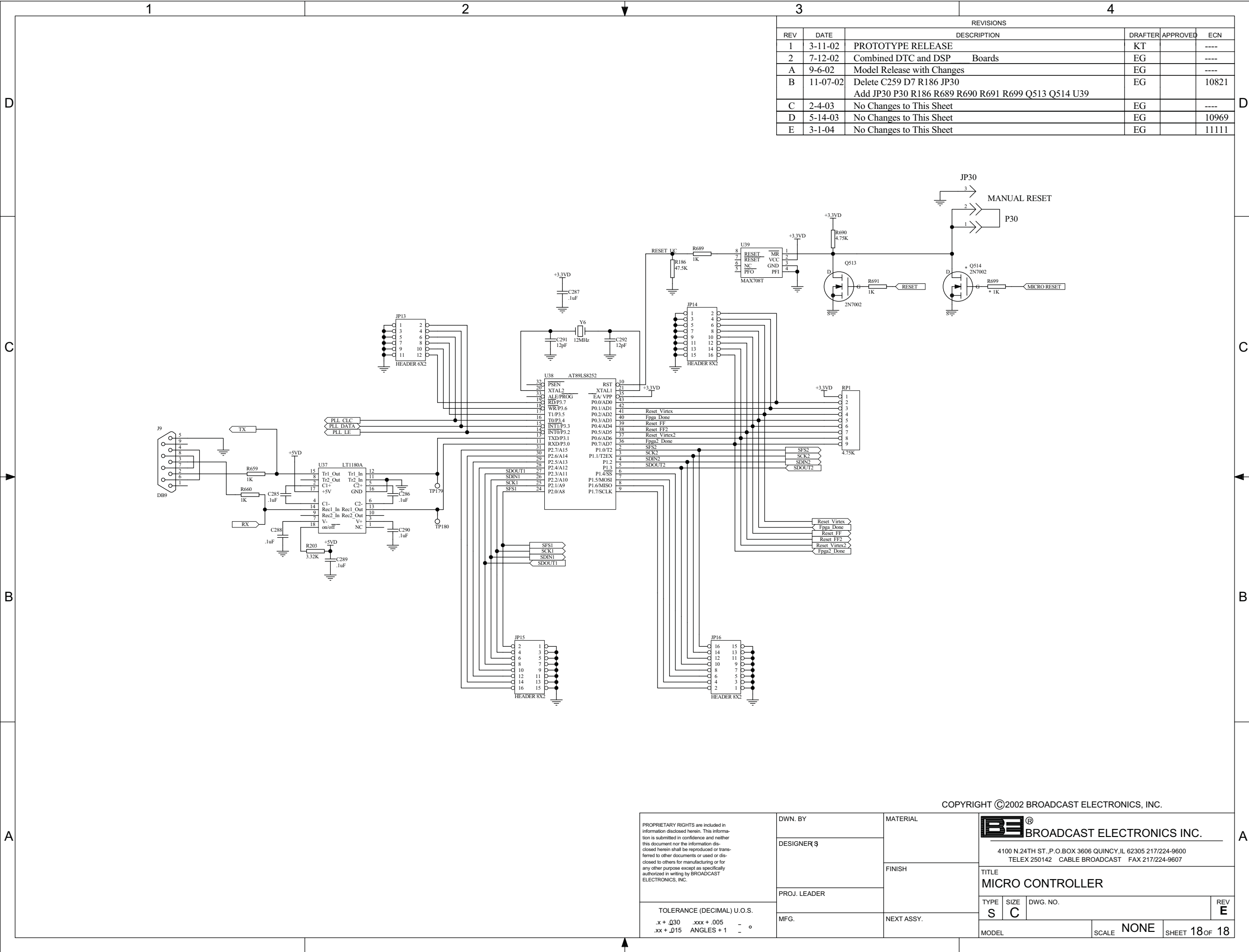
4100 N. 24TH ST., P.O. BOX 3696 QUINCY, IL 62305 217/224-8600
TELEX 256142 CABLE BROADCAST FAX 217/224-8607

TITLE
IBOC CARD INTERFACE

TYPE S	SIZE D	DWG. NO. 919-0542	REV E
------------------	------------------	-----------------------------	-----------------

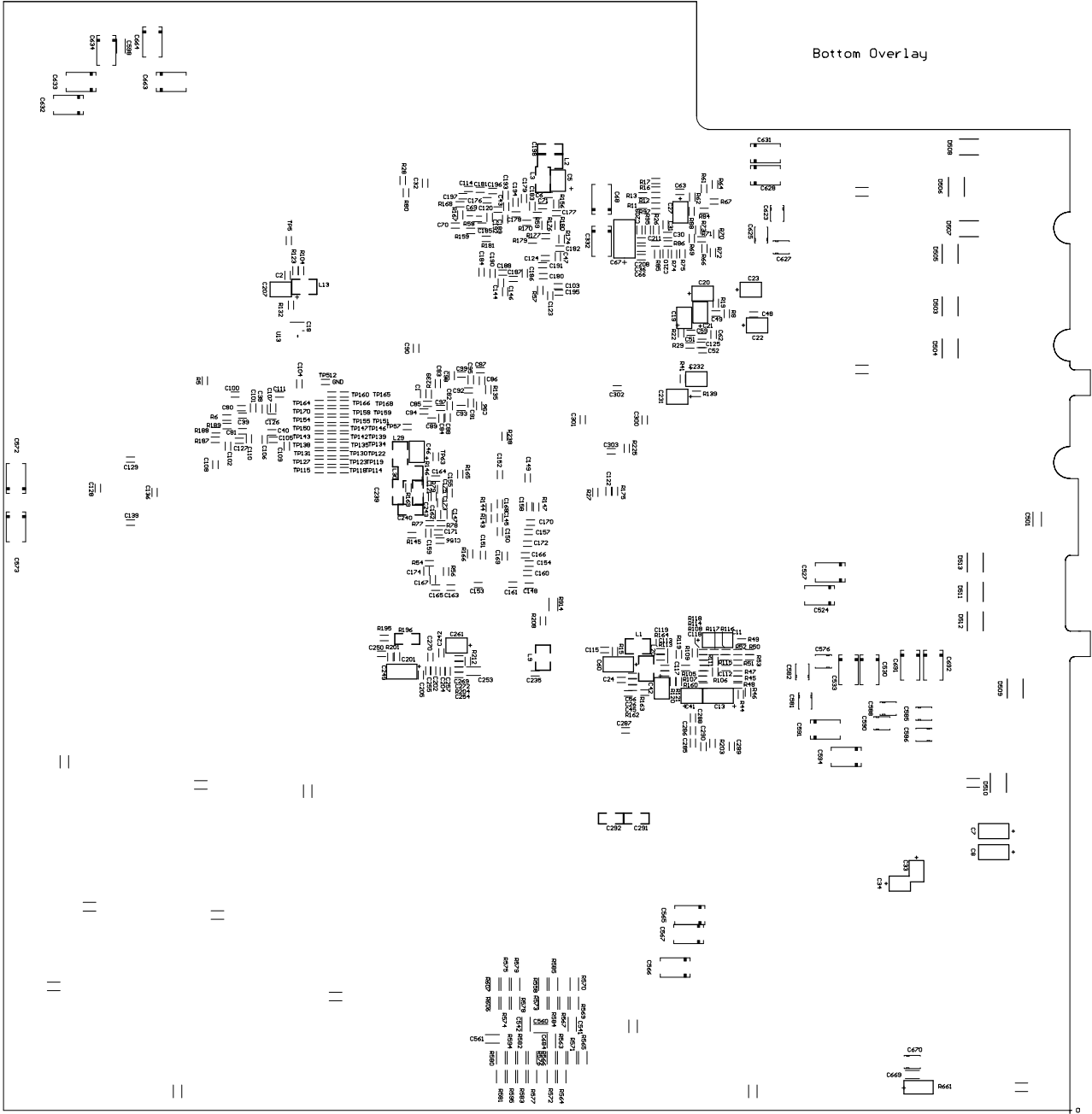
MODEL	SCALE NONE	SHEET 16 OF 18
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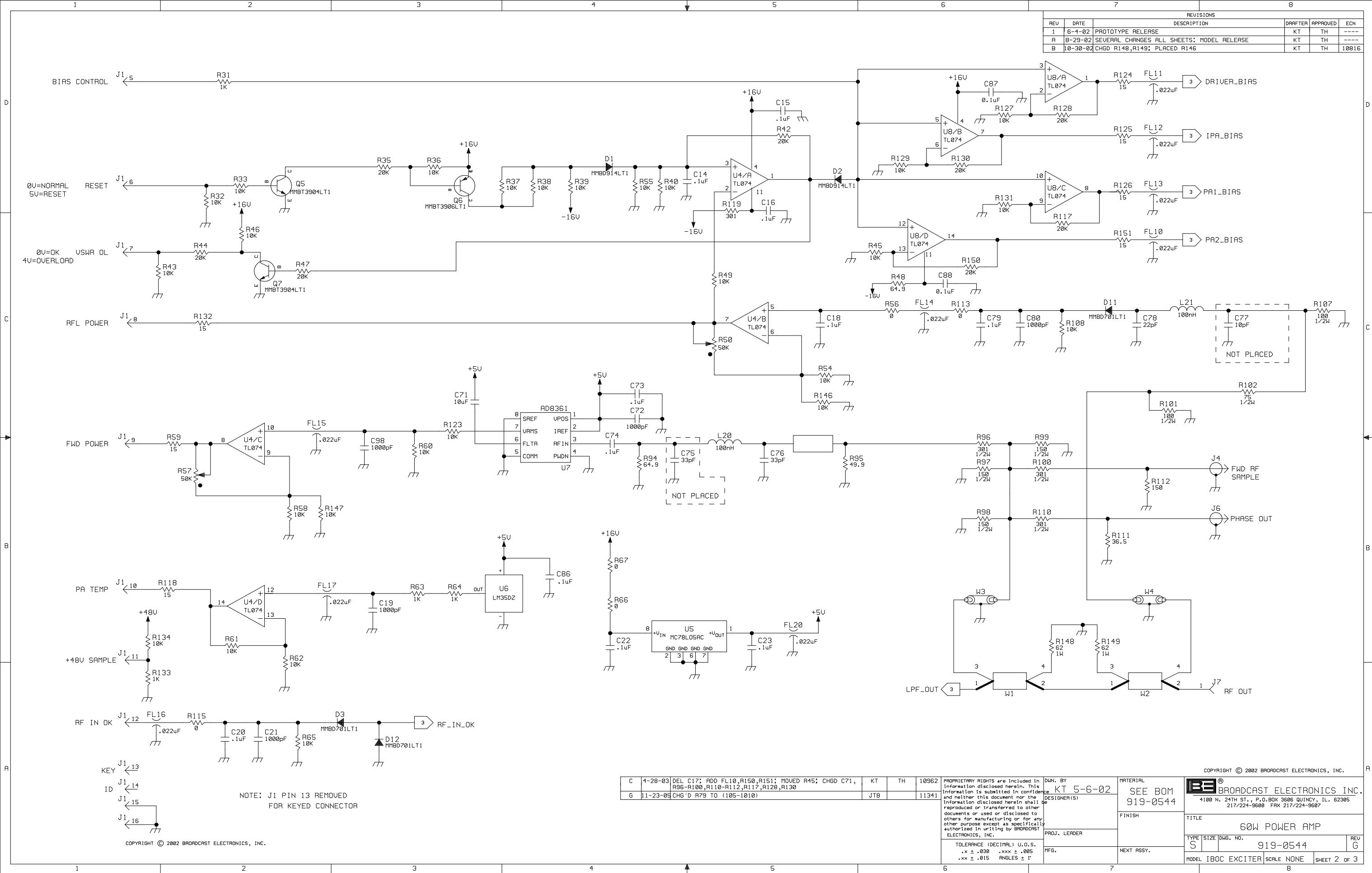




REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
2	7-12-02	COMBINED DTC AND DSP BOARDS	EG	DK	----
A	9-9-02	MADE SEVERAL CHANGES; MODEL RELEASE	EG	DK	----
B	11-07-02	MADE SEVERAL CHANGES; MODEL RELEASE	EG	DK	10821
C	11-07-02	UPDATED NOTES	EG	DK	----
D	4-10-03	NO CHANGE TO BOTTOM ASSEMBLY	KT	DK	10955
E	5-14-03	NO CHANGE TO BOTTOM ASSEMBLY	EG	DK	10969
F	10-9-03	NO CHANGE TO BOTTOM ASSEMBLY	KT	DK	11046
G	11-14-03	NO CHANGE TO BOTTOM ASSEMBLY	KT	DK	11071
H	3-1-04	INCREASED SPACING AROUND COMPONENTS, ADD R914	EG	DK	11111
L	7-8-05	ADDED PARTS TO THE NOT PLACED LIST	KT		11302

NOTES:
1. COMPONENTS NOT INSTALLED ON BOTTOM SIDE:
R6, R97, R135, R139, R143, R144, R146, R156, R159, R167,
R168, R170, R174, R176, R177, R179, R196, R607
TP5, TP57, TP63, TP114, TP115, TP118, TP119, TP122,
TP123, TP127, TP130, TP131, TP134, TP135, TP138,
TP139, TP142, TP143, TP146, TP147, TP150, TP151, TP154, TP155
TP158, TP159, TP160, TP164-TP166, TP168, TP170, TP512
C5,C6,C32,C43,C47,C69-C71,C103,C114,C120,C123,C124,C176-C198,L2,L3,
R57-R59,R28,R80,R180,R181





REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	6-4-02	PROTOTYPE RELEASE	KT	TH	----
A	8-29-02	SEVERAL CHANGES ALL SHEETS: MODEL RELEASE	KT	TH	----
B	10-30-02	CHGD R148,R149; PLACED R146	KT	TH	10816

KEY J1 13
ID J1 14
J1 15
J1 16

NOTE: J1 PIN 13 REMOVED
FOR KEYED CONNECTOR

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C	4-28-03	DEL C17; ADD FL10,R150,R151; MOVED R45; CHGD C71, R96-R100,R110-R112,R117,R128,R130	KT	TH	10962
G	11-23-05	CHG'D R79 TO (105-1010)	JTB		11341

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ELECTRONICS, INC.

TOLERANCE (DECIMAL) U.O.S.
.xx ± .030 .xxx ± .005
.xx ± .015 ANGLES ± 1°

DWN. BY
KT 5-6-02
DESIGNER(S)
PROJ. LEADER
MFG.

MATERIAL
SEE BOM
919-0544
FINISH
NEXT ASSY.

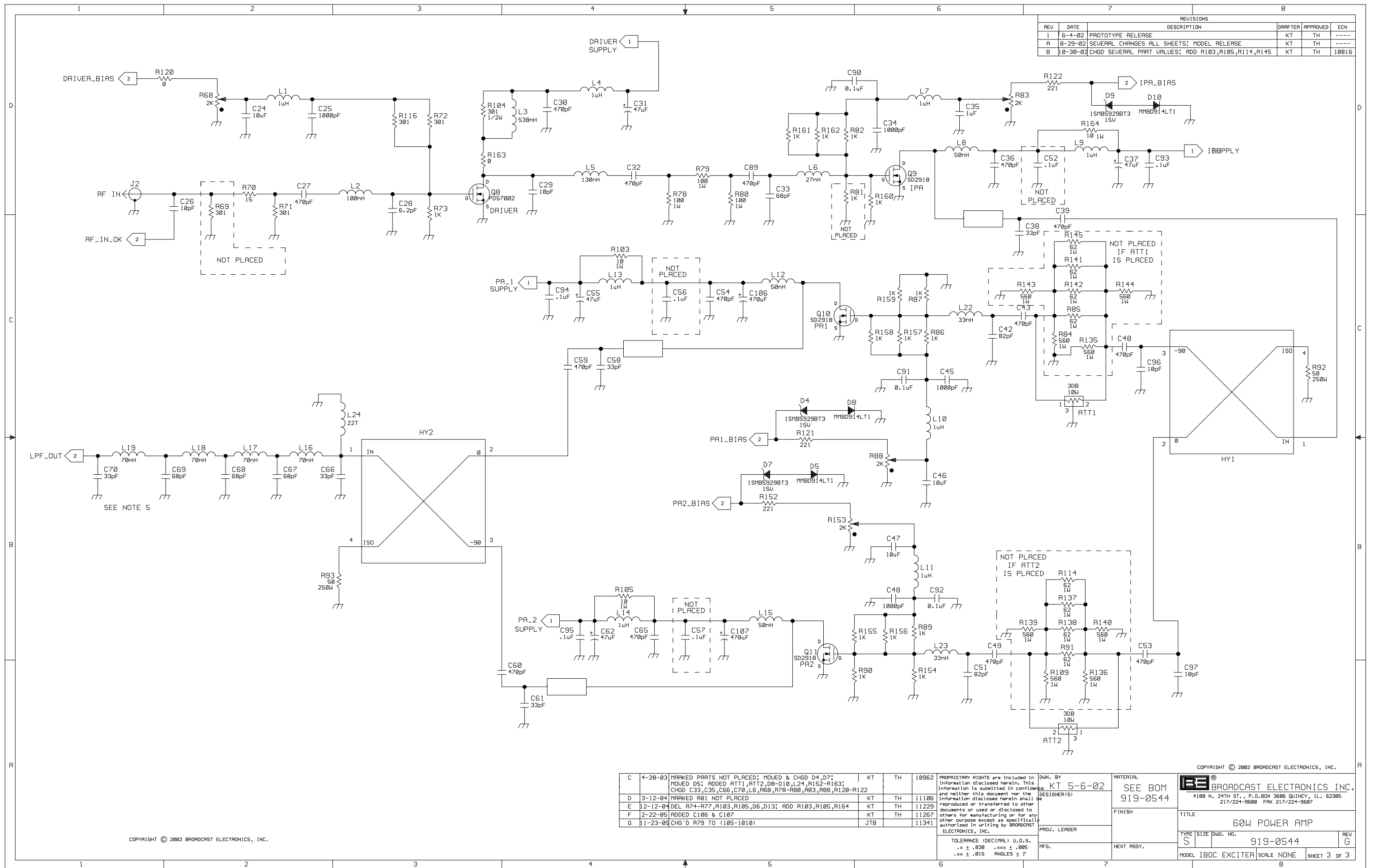
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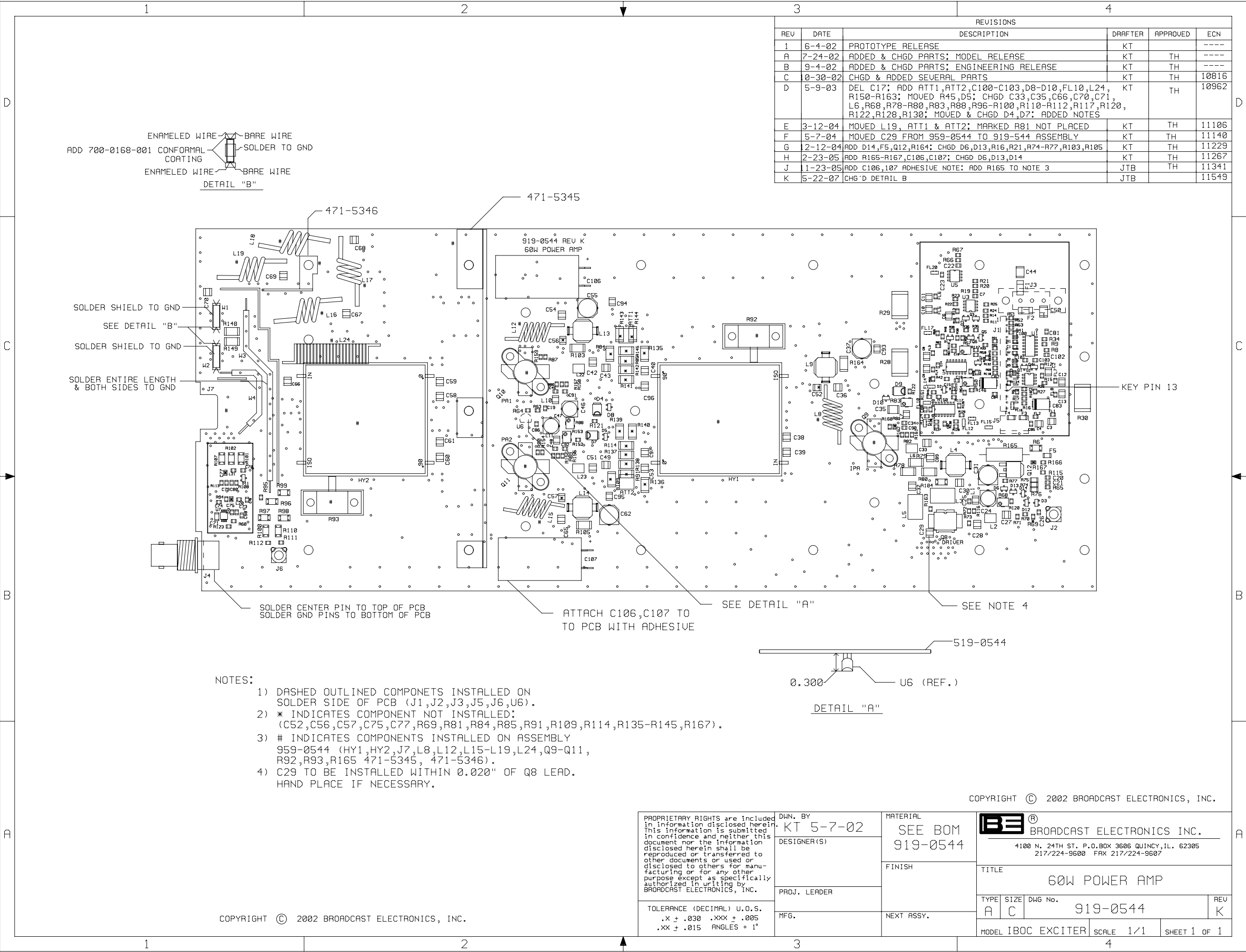
BE BROADCAST ELECTRONICS, INC.
4100 N. 24TH ST., P.O. BOX 3600 QUINCY, IL. 62305
217/224-9600 FAX 217/224-9607

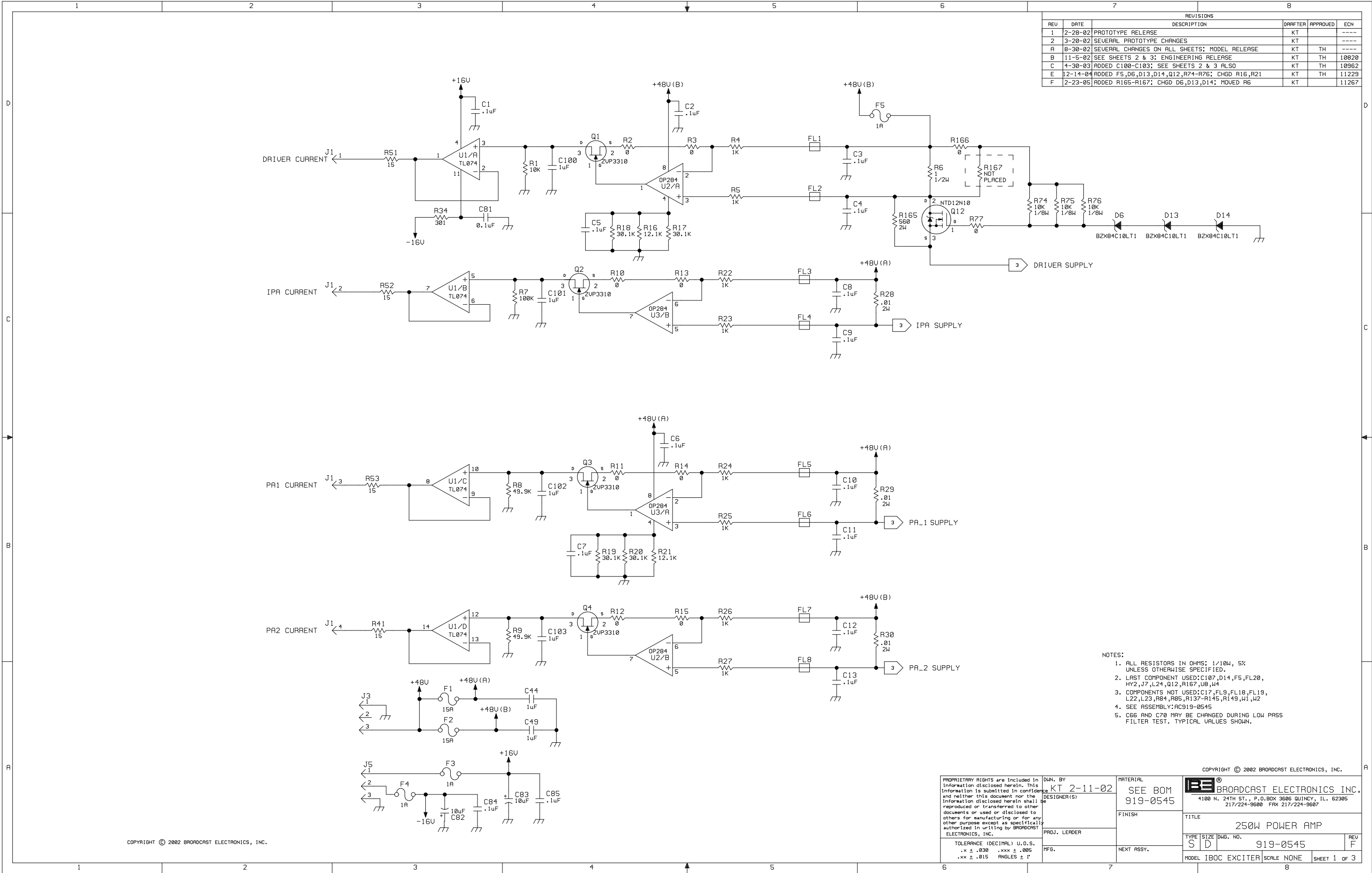
TITLE
60W POWER AMP

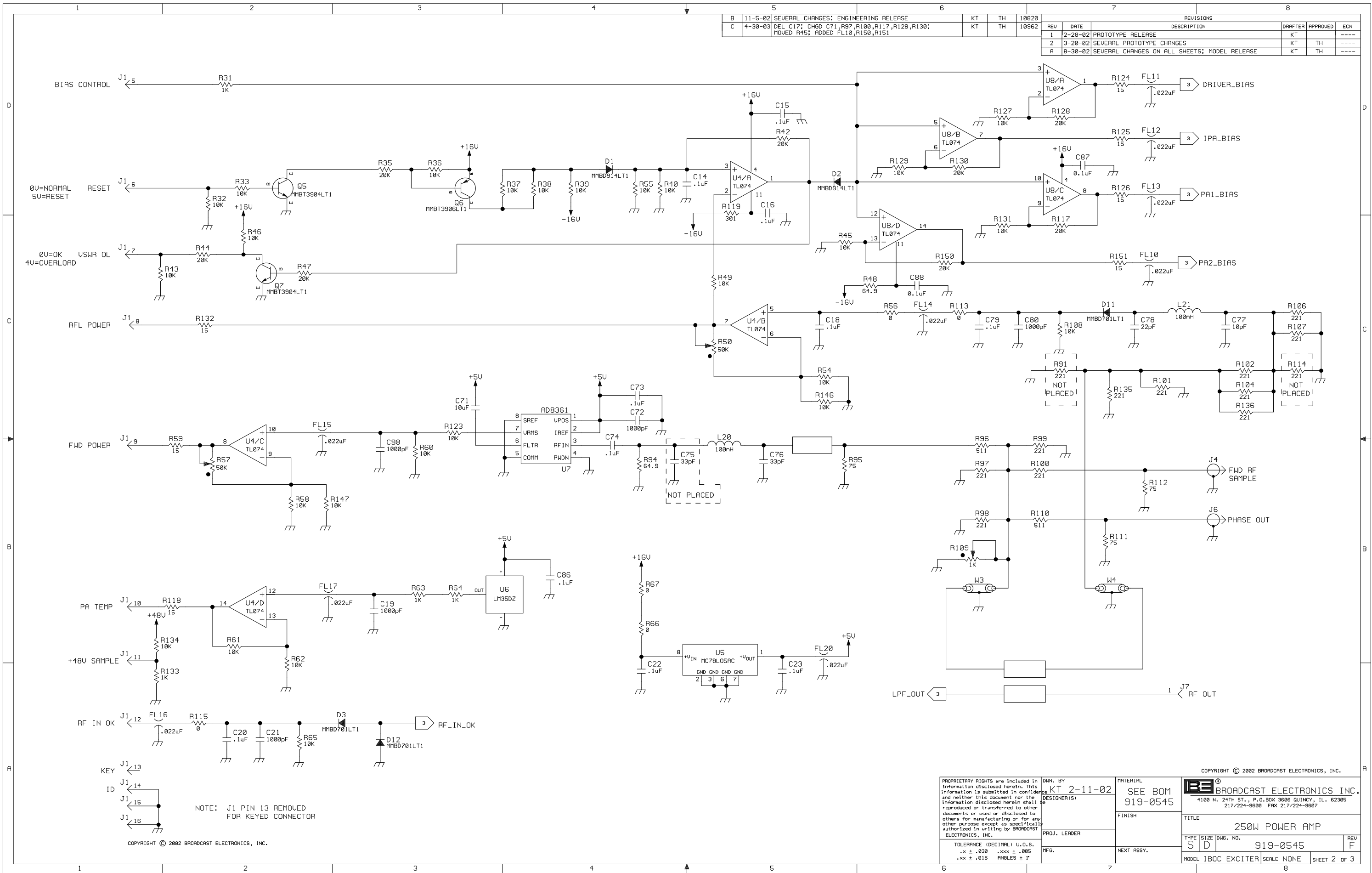
TYPE SIZE DWG. NO. REV
S 919-0544 G

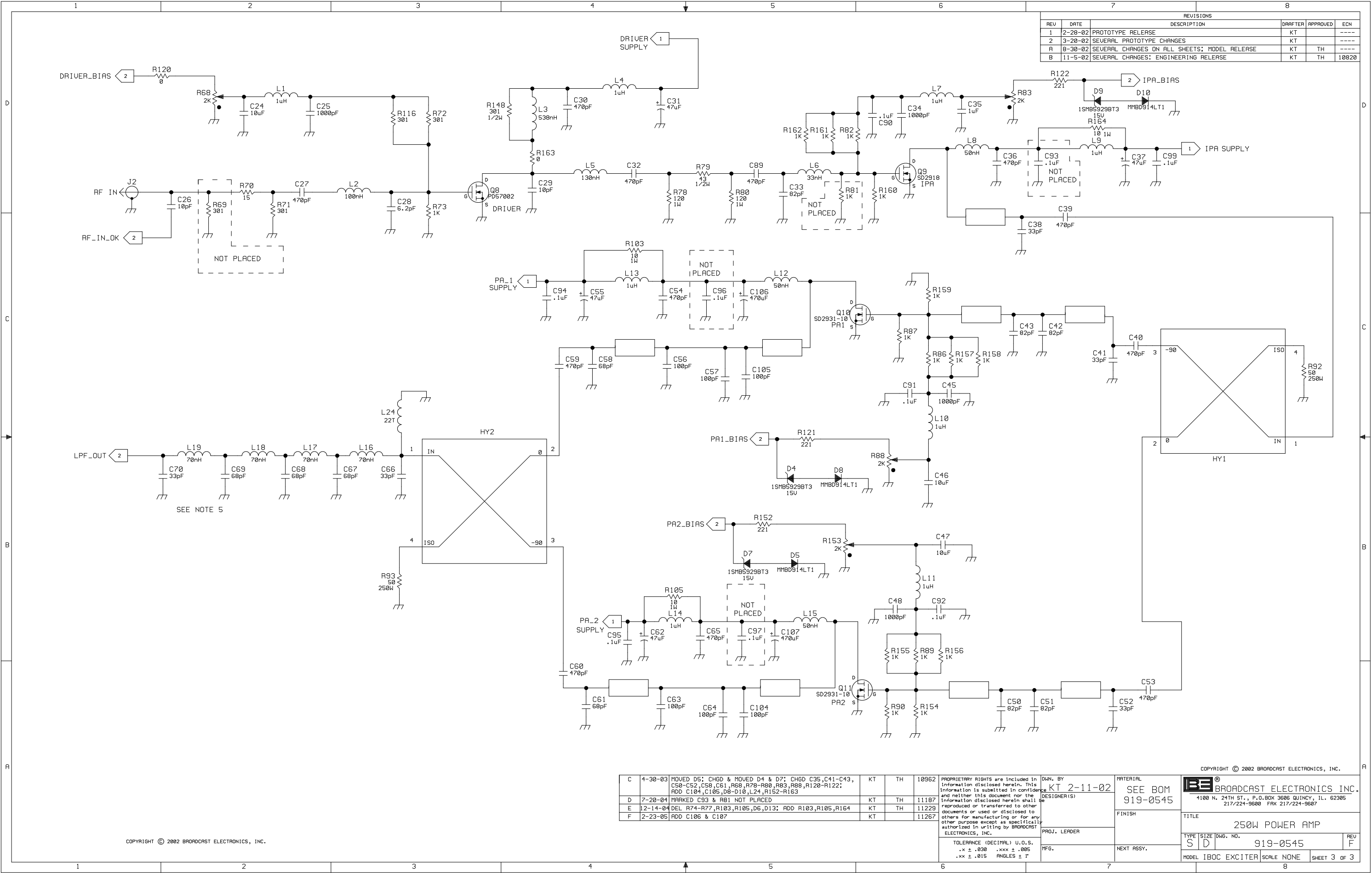
MODEL IBOC EXCITER SCALE NONE SHEET 2 OF 3











REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	2-28-02	PROTOTYPE RELEASE	KT		----
2	3-20-02	SEVERAL PROTOTYPE CHANGES	KT		----
A	8-30-02	SEVERAL CHANGES ON ALL SHEETS; MODEL RELEASE	KT	TH	----
B	11-5-02	SEVERAL CHANGES; ENGINEERING RELEASE	KT	TH	10820

C	4-30-03	MOVED D5; CHGD & MOVED D4 & D7; CHGD C35,C41-C43, C50-C52,C58,C61,R68,R78-R80,R83,R88,R120-R122; ADD C104,C105,D8-D10,L24,R152-R163	KT	TH	10962
D	7-20-04	MARKED C93 & R81 NOT PLACED	KT	TH	11187
E	12-14-04	DEL R74-R77,R103,R105,D6,D13; ADD R103,R105,R164	KT	TH	11229
F	2-23-05	ADD C106 & C107	KT		11267

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TOLERANCE (DECIMAL) U.O.S.
.x ± .030 .xxx ± .005
.xx ± .015 ANGLES ± 1°

DWN. BY
KT 2-11-02
DESIGNER(S)
PROJ. LEADER
MFG.

MATERIAL
SEE BOM
919-0545
FINISH
NEXT ASSY.

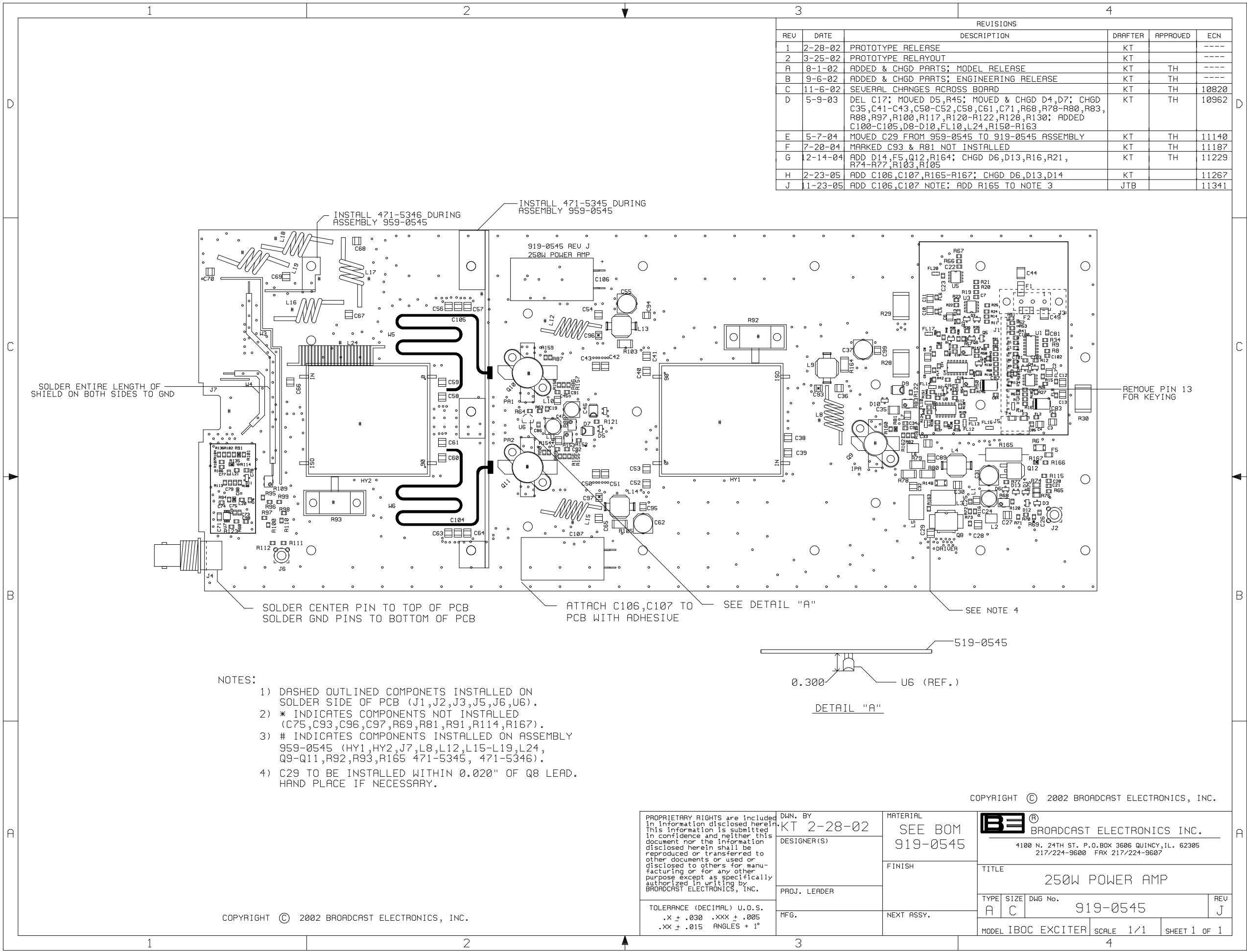
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BROADCAST ELECTRONICS INC.
4180 N. 24TH ST., P.O. BOX 3606 QUINCY, IL. 62305
217/224-9600 FAX 217/224-9607

TITLE
250W POWER AMP


TYPE SIZE DWG. NO. REV
S D 919-0545 F

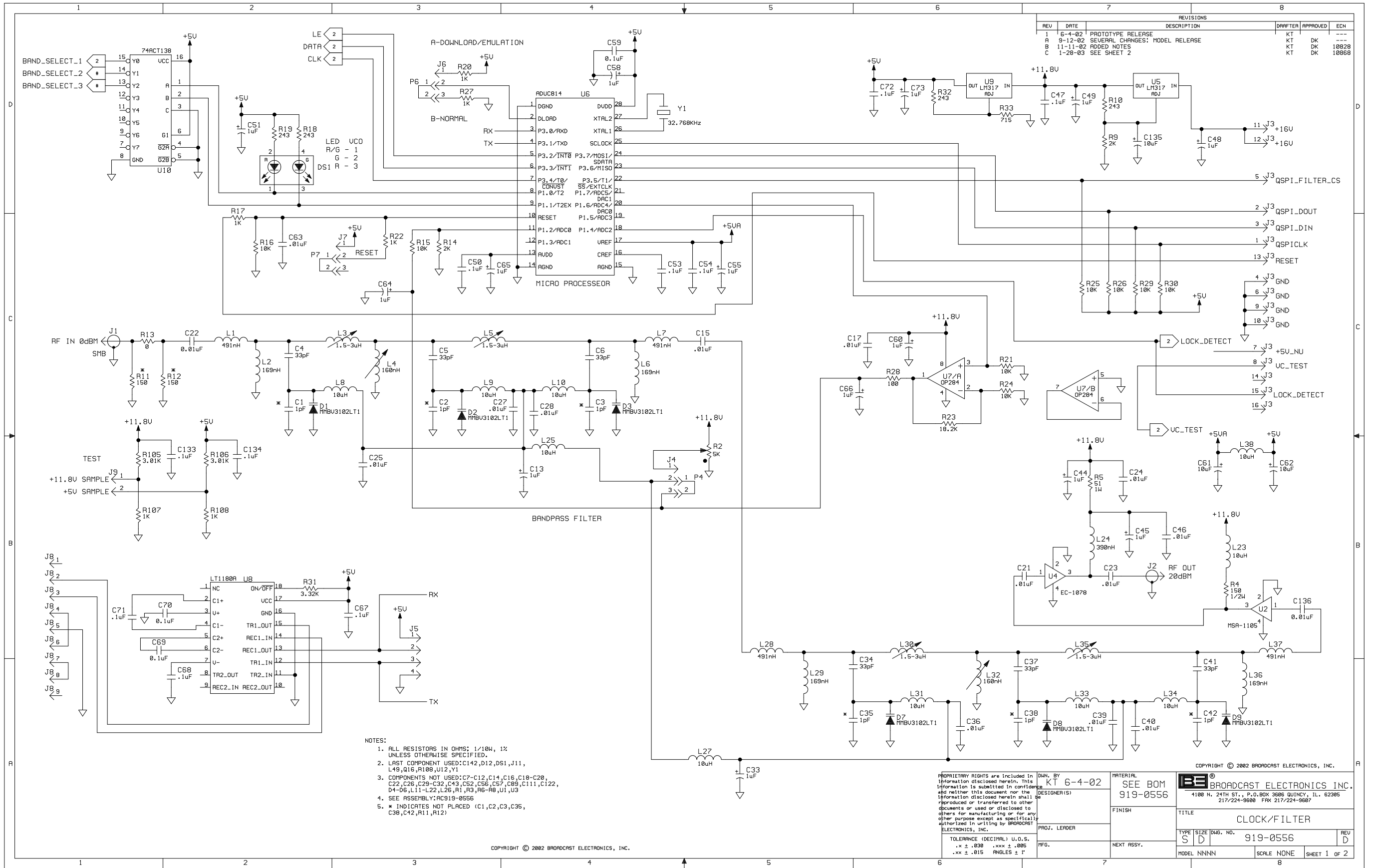
MODEL IBOC EXCITER SCALE NONE SHEET 3 OF 3

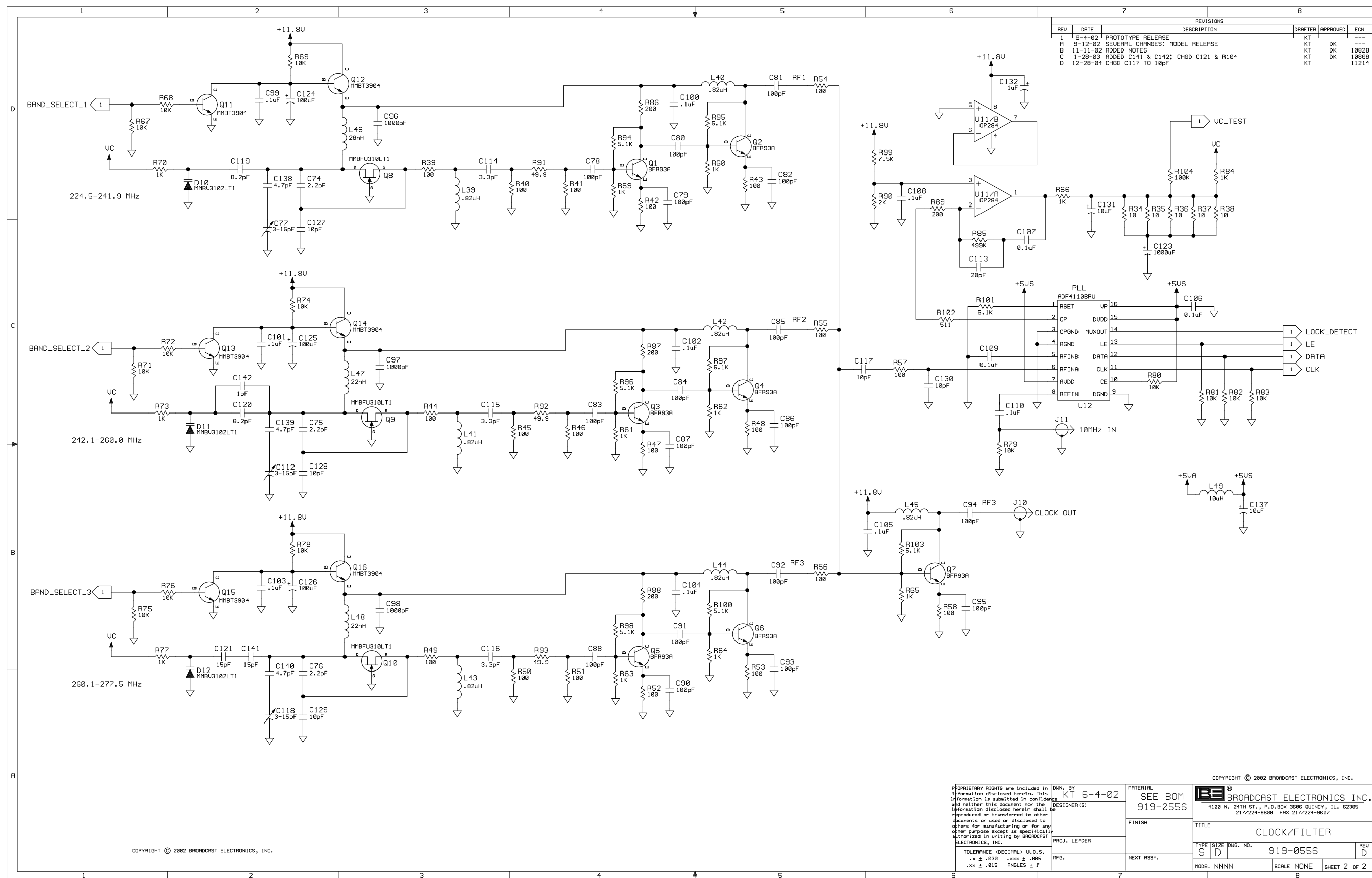


REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	2-28-02	PROTOTYPE RELEASE	KT		----
2	3-25-02	PROTOTYPE RELAYOUT	KT		----
A	8-1-02	ADDED & CHGD PARTS; MODEL RELEASE	KT	TH	----
B	9-6-02	ADDED & CHGD PARTS; ENGINEERING RELEASE	KT	TH	----
C	11-6-02	SEVERAL CHANGES ACROSS BOARD	KT	TH	10820
D	5-9-03	DEL C17; MOVED D5,R45; MOVED & CHGD D4,D7; CHGD C35,C41-C43,C50-C52,C58,C61,C71,R68,R78-R80,R83,R88,R97,R100,R117,R120-R122,R128,R130; ADDED C100-C105,D8-D10,FL10,L24,R150-R163	KT	TH	10962
E	5-7-04	MOVED C29 FROM 959-0545 TO 919-0545 ASSEMBLY	KT	TH	11140
F	7-20-04	MARKED C93 & R81 NOT INSTALLED	KT	TH	11187
G	12-14-04	ADD D14,F5,Q12,R164; CHGD D6,D13,R16,R21,R74-R77,R103,R105	KT	TH	11229
H	2-23-05	ADD C106,C107,R165-R167; CHGD D6,D13,D14	KT		11267
J	1-23-05	ADD C106,C107 NOTE: ADD R165 TO NOTE 3	JTB		11341


- NOTES:
- 1) DASHED OUTLINED COMPONETS INSTALLED ON SOLDER SIDE OF PCB (J1,J2,J3,J5,J6,U6).
 - 2) * INDICATES COMPONENTS NOT INSTALLED (C75,C93,C96,C97,R69,R81,R91,R114,R167).
 - 3) # INDICATES COMPONENTS INSTALLED ON ASSEMBLY 959-0545 (HY1,HY2,J7,L8,L12,L15-L19,L24,Q9-Q11,R92,R93,R165 471-5345, 471-5346).
 - 4) C29 TO BE INSTALLED WITHIN 0.020" OF Q8 LEAD. HAND PLACE IF NECESSARY.

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		DESIGNER(S)	FINISH			
		PROJ. LEADER	NEXT ASSY.		TITLE 250W POWER AMP	
		MFG.			TYPE A	SIZE C
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES ± 1°				DWG No. 919-0545		REV J
				MODEL IBOC EXCITER		SCALE 1/1
				SHEET 1 OF 1		





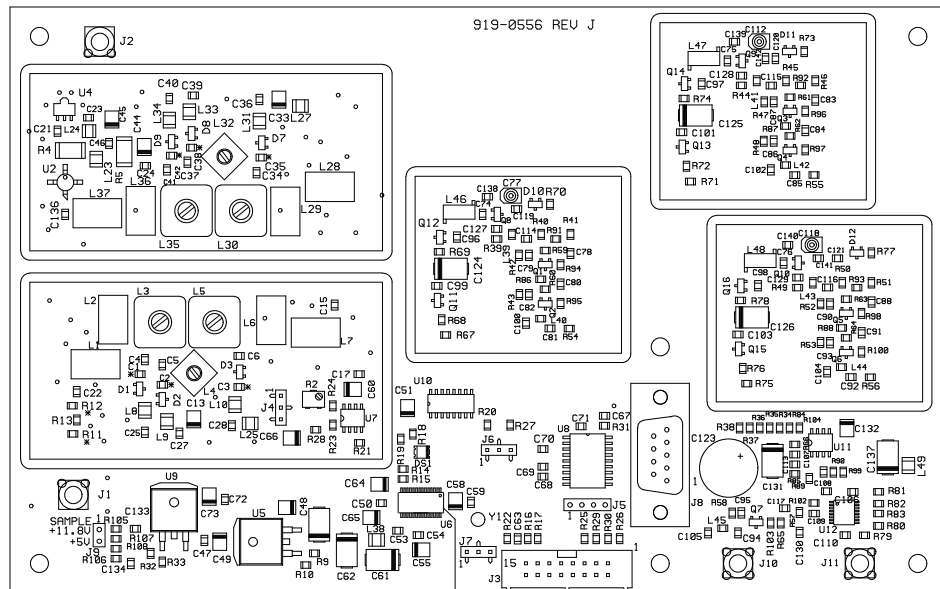
REVISIONS					
REV	DATE	DESCRIPTION	DRAWER	APPROVED	ECN
1	6-4-02	PROTOTYPE RELEASE	KT		---
A	9-12-02	SEVERAL CHANGES: MODEL RELEASE	KT	DK	---
B	11-11-02	ADDED NOTES	KT	DK	10826
C	11-03	MODEL C141 & C142: CHGD C121 & R104	KT	DK	10866
D	12-28-04	CHGD C117 TO 104F	KT		11214

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		DESIGNER(S) 919-0556		FINISH		TITLE CLOCK/FILTER	
TOLERANCE (DECIMAL) U.O.S. .xx ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°		PROJ. LEADER		TYPE S SIZE DWG. NO.		919-0556	
HFG.		NEXT ASSY.		MODEL NNNN		SCALE NONF SHEET 2 OF 2	

F 7-10-03 UPDATED SOFTWARE 979-0556-U6 TO VER 1.7 KT DK 11004
 G 9-9-03 UPDATED SOFTWARE 979-0556-U6 TO VER 1.8 KT DK 11029
 H 12-28-04 UPDATED SOFTWARE 979-0556-U6 TO VER 2.0; CHGD C117 KT DK 11214
 J 3-28-05 UPDATED SOFTWARE 979-0556-U6 TO VER 2.1 KT 11279

REVISIONS

REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	7-2-02	PROTOTYPE RELEASE	KT		----
A	9-12-02	SEVERAL CHANGES; MODEL RELEASE	KT	DK	----
B	11-11-02	ADDED NOTE 4	KT	DK	10828
C	1-28-03	ADDED C141 & C142; CHGD C121 & R104 & 979-0556-U6	KT	JL	10868
D	2-3-03	UPDATED SOFTWARE 979-0556-U6 TO VER 1.5	KT	DK	10869
E	4-10-03	UPDATED SOFTWARE 979-0556-U6 TO VER 1.6	KT	DK	10956



NOTES:

1. LAST COMPONENT USED: C142,D12,DS1,J11, L49,Q16,R108,U12,Y1.
2. COMPONENTS NOT USED: C7-C12,C14,C16,C18-C20, C22,C26,C29-C32,C43,C52,C56,C57,C111,C122, D4-D6,L11-L22,L26,R1,R3,R6-R8,U1,U3.
3. * INDICATES PARTS NOT PLACED: C1,C2,C3, C35,C38,C42,R11,R12.
4. INSTALL 979-0556-U6 VER 2.1 ADD LABEL INDICATING U6 AND VER# ON TOP OF U6.

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TOLERANCE (DECIMAL) U.O.S.
 .X ± .030 .XXX ± .005
 .XX ± .015 ANGLES + 1°

DWN. BY
 KT 6-13-02
 DESIGNER(S)


PROJ. LEADER

MFG.

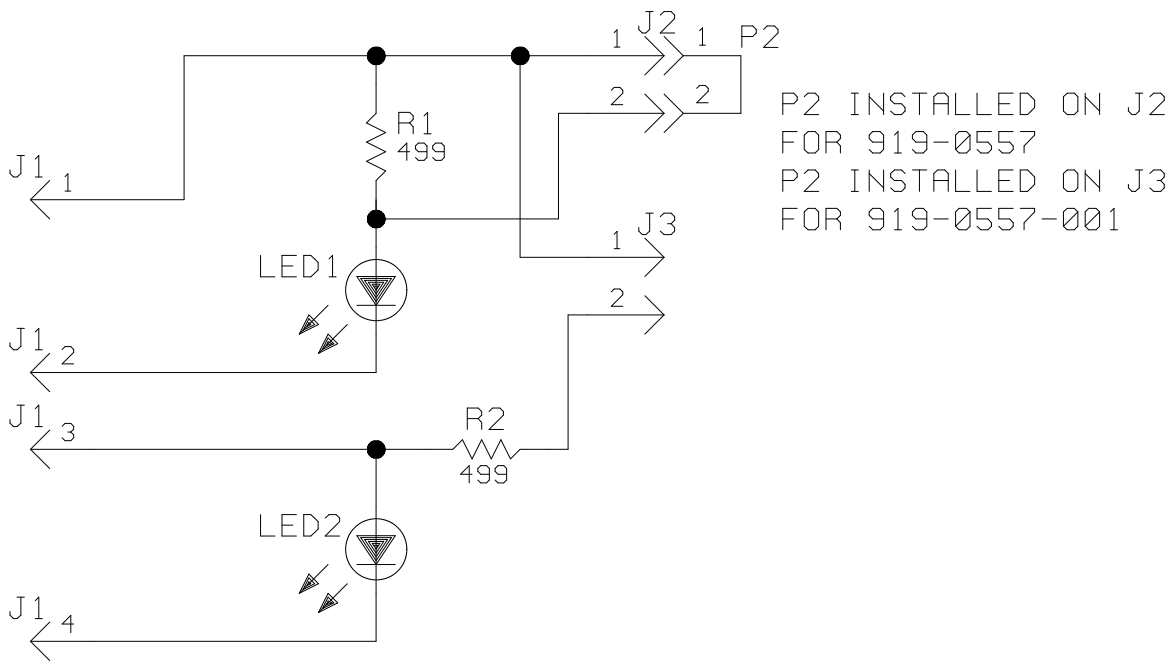
MATERIAL
 SEE BOM
 919-0556

FINISH


NEXT ASSY.

 BROADCAST ELECTRONICS INC. 4100 N. 24TH ST. P.O.BOX 3606 QUINCY,IL. 62305 217/224-9600 FAX 217/224-9607			
TITLE CLOCK/FILTER BOARD			
TYPE A	SIZE B	DWG No. 919-0556	REV J
MODEL NNNN		SCALE 1/1	SHEET 1 of 1

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
A	5-23-02	MODEL RELEASE	KT	RH	----
B	9-18-02	ADDED R1,R2,P2,J2 & J3; ENGINEERING RELEASE	KT		10782



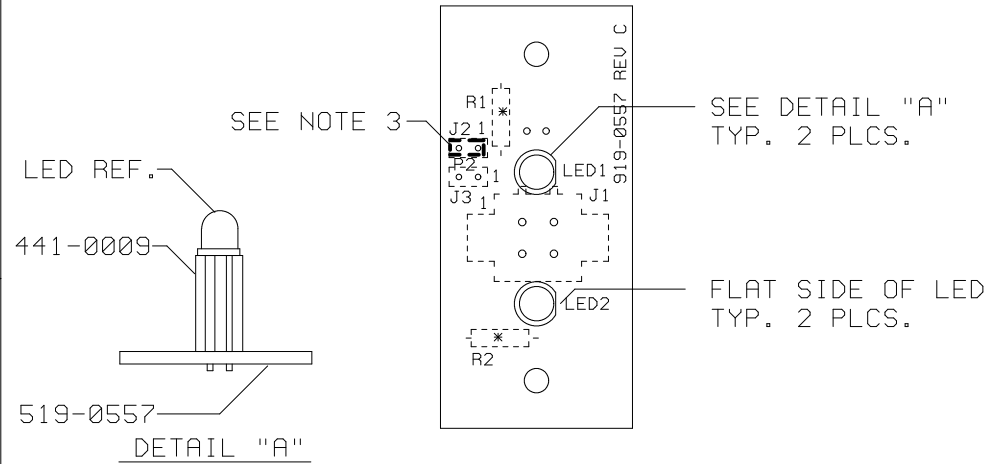
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	DESIGNER(S) RH 5-23-02	919-0557 919-0557-001			
	PROJ. LEADER	FINISH	TITLE FRONT PANEL LED BOARD		
	MFG.	NEXT ASSY.	TYPE S	SIZE A	DWG. NO. 919-0557/-001
TOLERANCE (DECIMAL) U.O.S. .x ± .030 .xxx ± .005 .xx ± .015 ANGLES ± 1°			MODEL FM-IBOC	SCALE NONE	SHEET 1 OF 1


REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
A	5-23-02	MODEL RELEASE	KT		----
B	8-15-02	CORRECTED DETAIL	KT		----
C	9-18-02	ADDED R1,R2,J2,J3,P2; ENGINEERING RELEASE	KT		10782

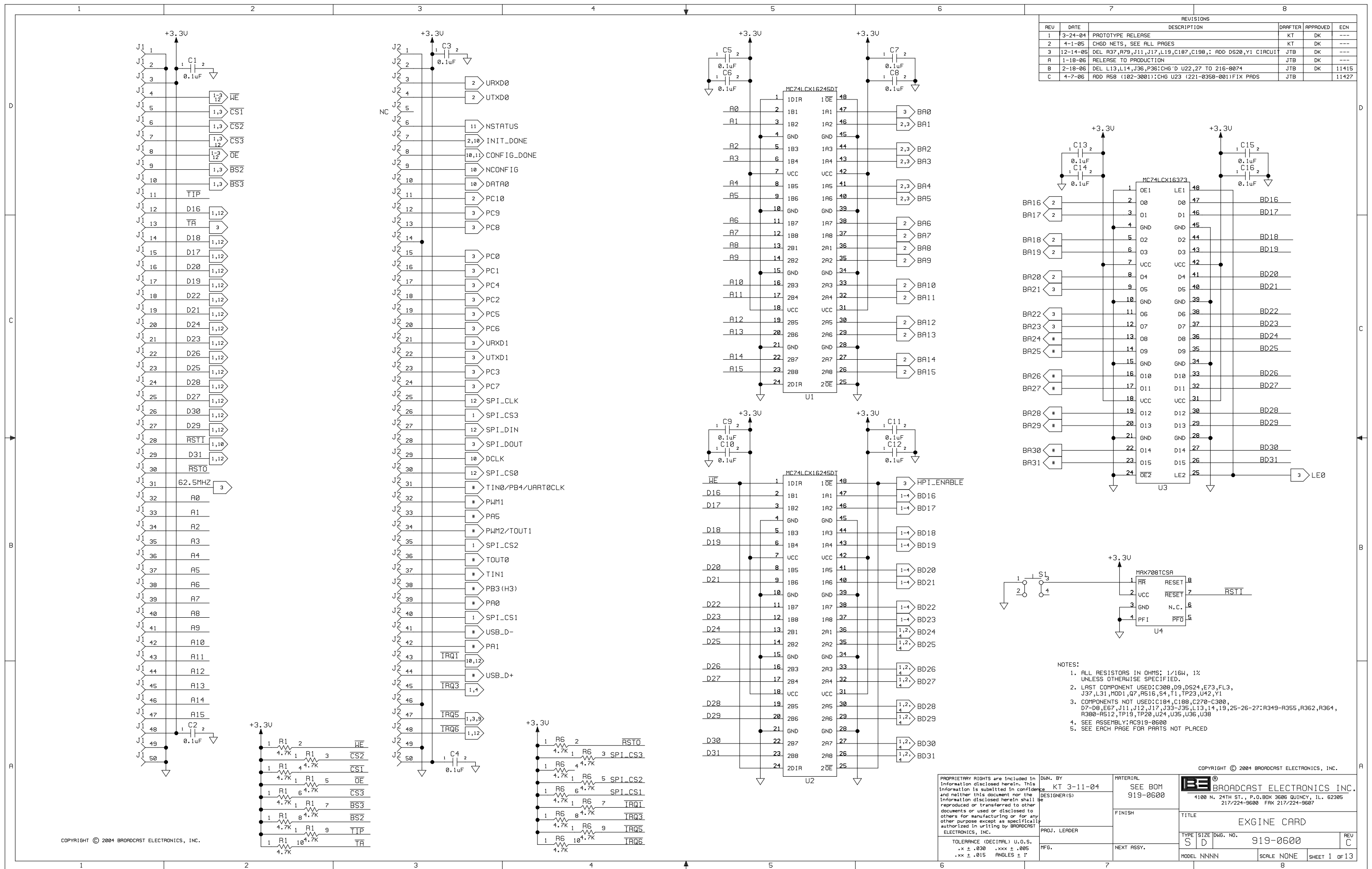
- NOTES:
- 1: J1,J2,J3,R1,R2 ARE MOUNTED ON THE SOLDER SIDE.
 - 2: * INDICATES R1,R2 ARE NOT MOUNTED ON 919-0557.
 - 3: P2 IS INSTALLED ON J2 FOR 919-0557.
P2 IS INSTALLED ON J3 FOR 919-0557-001.

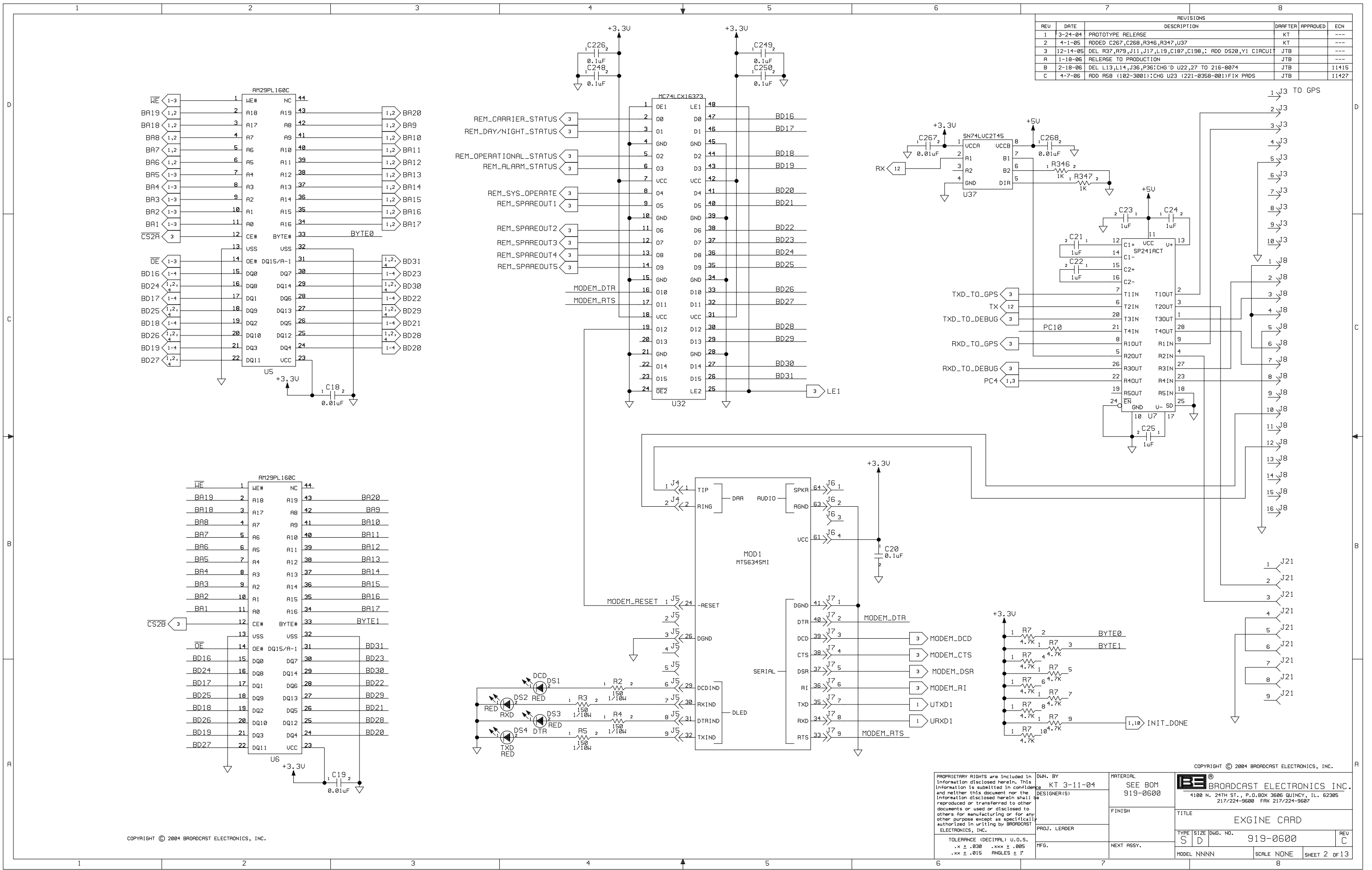
COMPONENT	919-0557	919-0557-001
LED1	323-9224	323-9224
LED2	323-9217	323-9224



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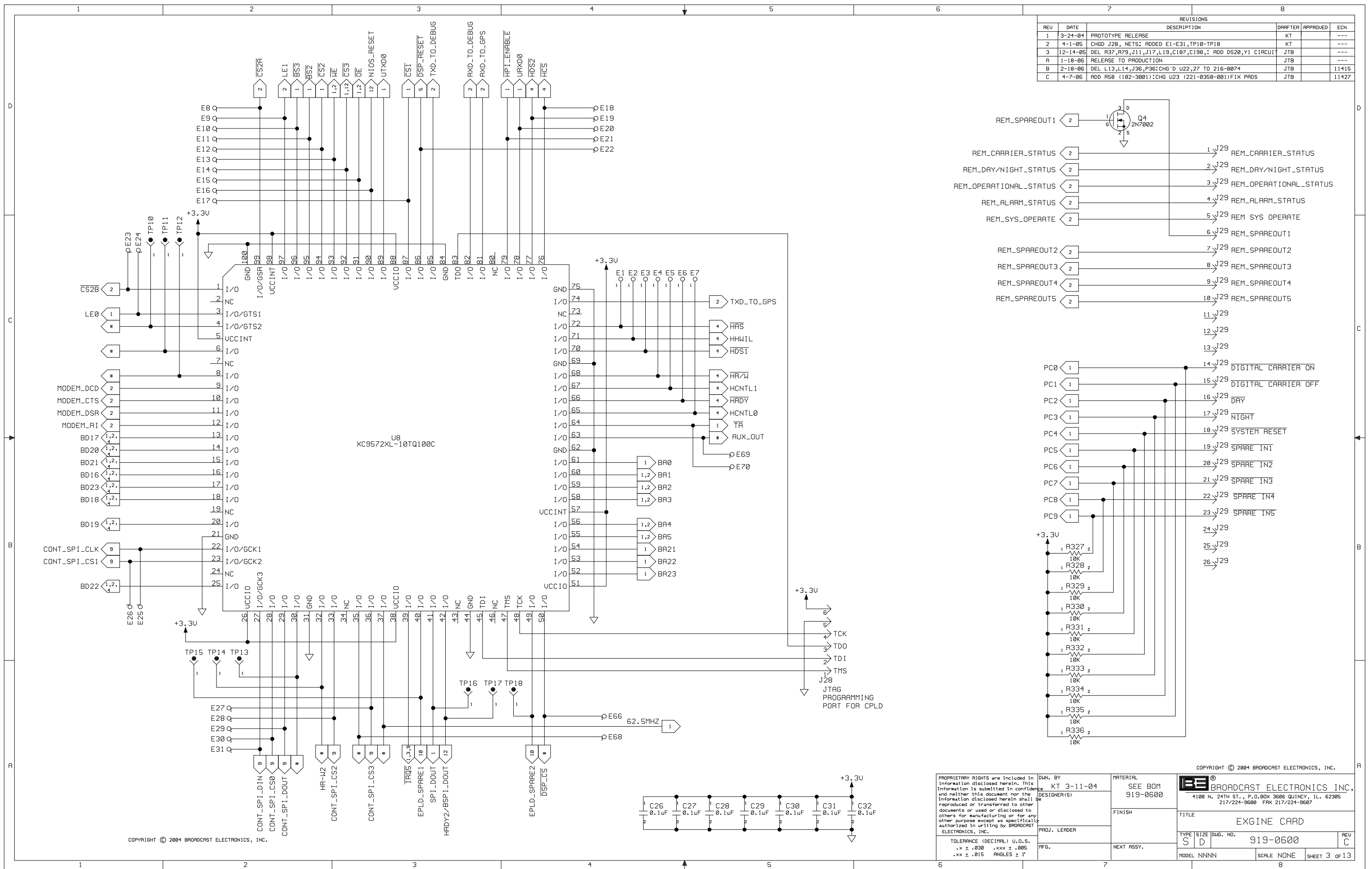
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	KT 5-23-02	SEE BOMS 919-0557 919-0557-001				
	DESIGNER(S)	FINISH	TITLE			
	PROJ. LEADER		FRONT PANEL LED BOARD			
TOLERANCE (DECIMAL) U.O.S. .X ± .030 .XXX ± .005 .XX ± .015 ANGLES + 1°	MFG.	NEXT ASSY.	TYPE A	SIZE A	DWG No. 919-0557/-001	REV C
			MODEL NNNN	SCALE 1/1	SHEET 1 OF 1	

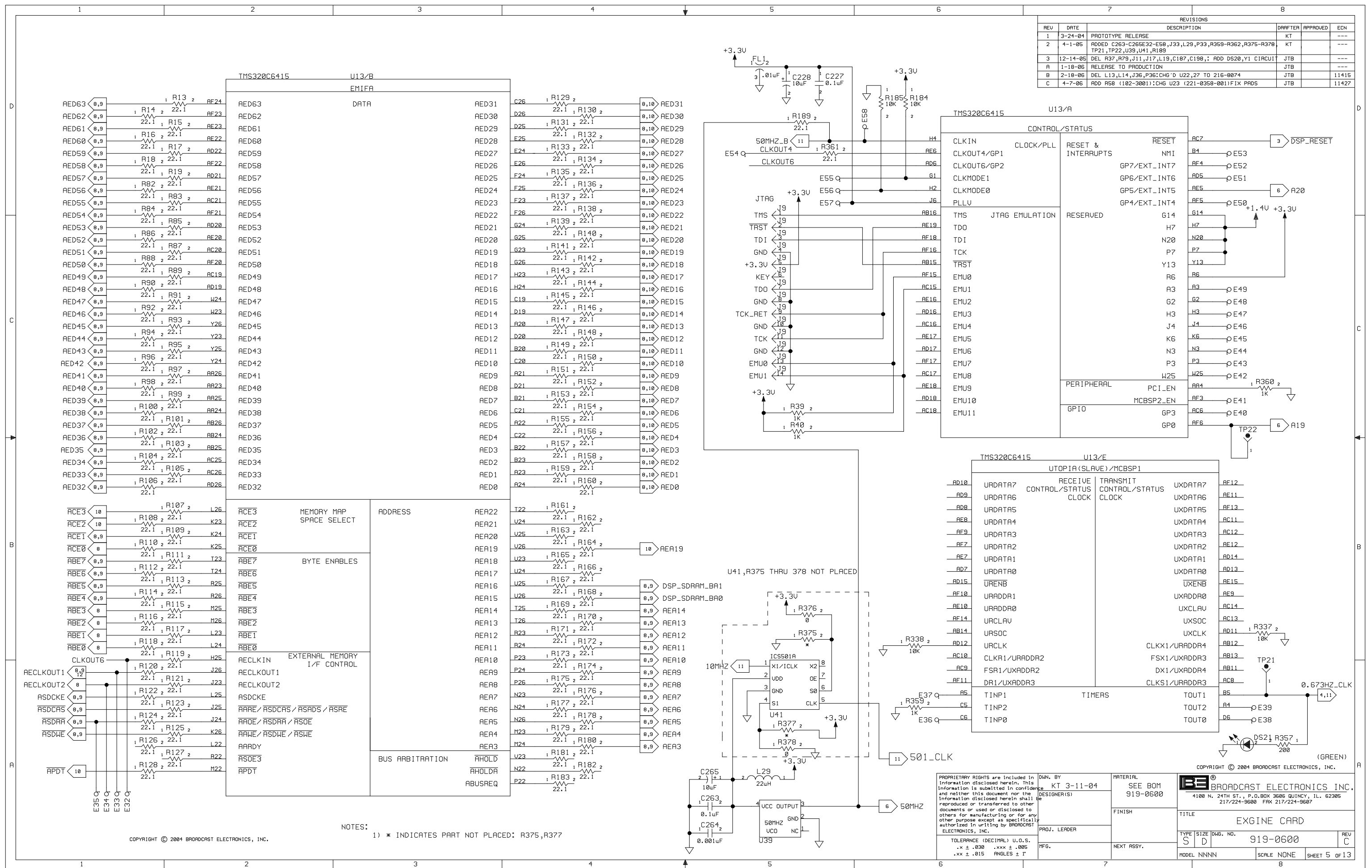


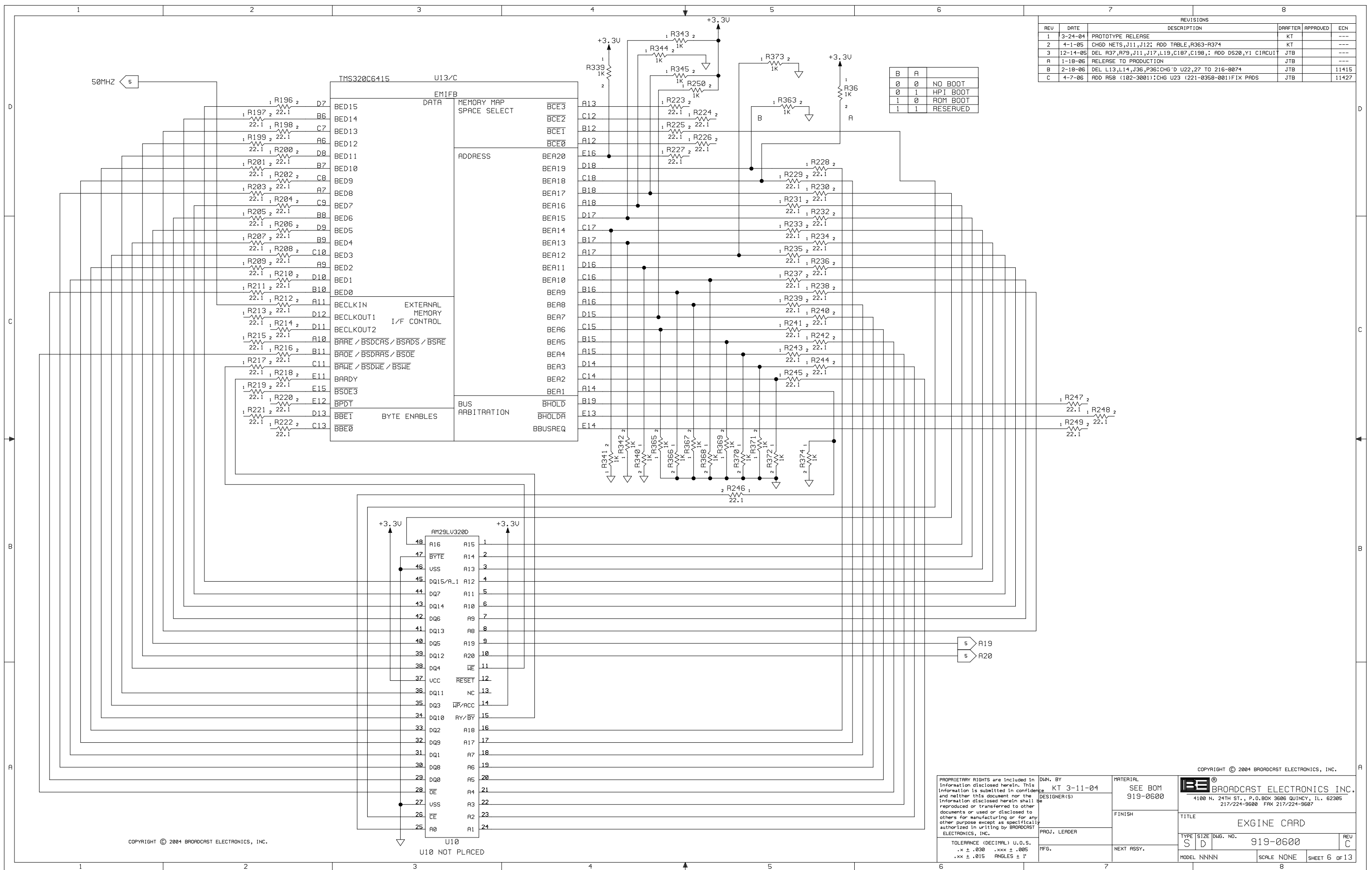


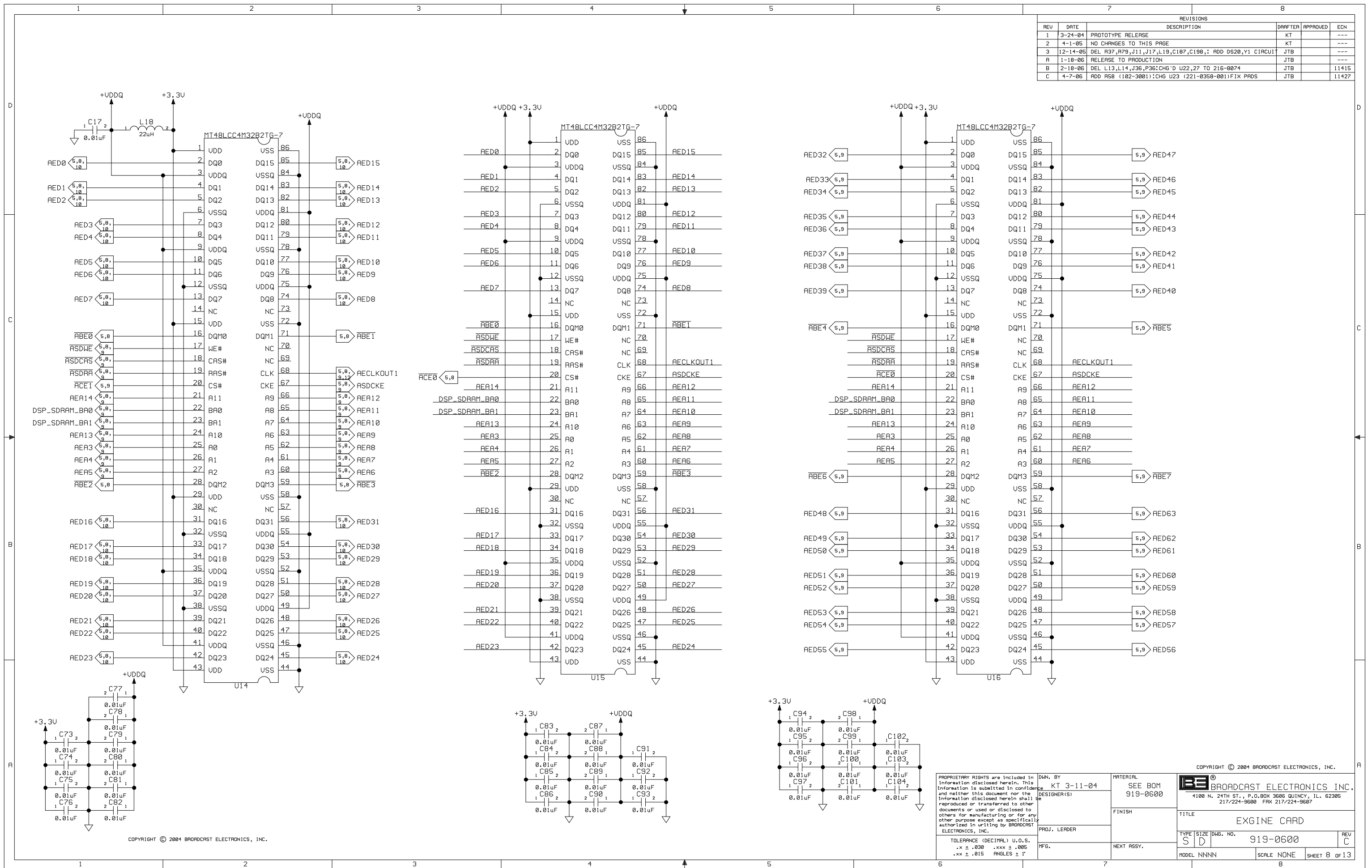
REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-24-04	PROTOTYPE RELEASE	KT		---
2	4-1-05	ADDED C267,C268,R346,R347,U37	KT		---
3	12-14-05	DEL R37,R79,J11,J17,L19,C187,C198,: ADD DS20,Y1 CIRCUIT	JTB		---
A	1-18-06	RELEASE TO PRODUCTION	JTB		---
B	2-18-06	DEL L13,L14,J36,P36:CHG'D U22,27 TO 216-8874	JTB		11415
C	4-7-06	ADD R58 (102-3801):CHG U23 (221-0358-001)FIX PADS	JTB		11427

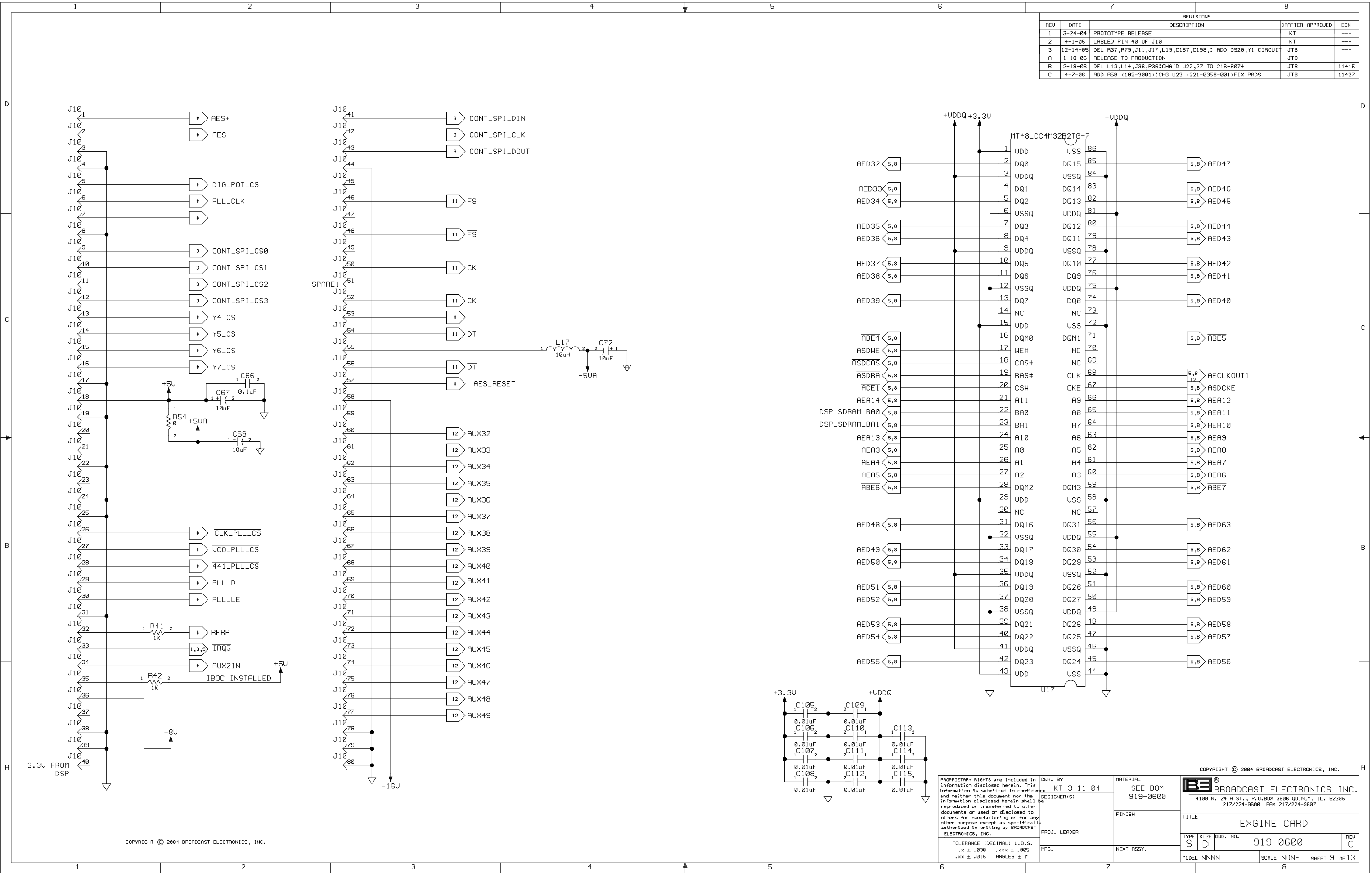
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TOLERANCE (DECIMAL) U.O.S. ..xx ± .030 .xxx ± .005 ..xx ± .015 ANGLES ± 1°			PROJ. LEADER		MFG.		NEXT ASSY.		TYPE SIZE DWG. NO. S D 919-0600	
									MODEL NNNN	
									SCALE NONE	
									SHEET 2 OF 13	











REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	3-24-04	PROTOTYPE RELEASE	KT		---
2	4-1-05	LABLED PIN 40 OF J10	KT		---
3	12-14-05	DEL R37,R79,J11,J17,L19,C107,C198,: ADD DS20,Y1 CIRCUIT	JTB		---
A	1-18-06	RELEASE TO PRODUCTION	JTB		---
B	2-18-06	DEL L13,L14,J36,P36:CHG'D U22,27 TO 216-8074	JTB		11415
C	4-7-06	ADD R58 (102-3001):CHG U23 (221-0358-001)FIX PRDS	JTB		11427

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TOLERANCE (DECIMAL) U.O.S.
..x ± .030
..xxx ± .005
..xx ± .015 ANGLES ± 1°

DWN. BY
KT 3-11-04
DESIGNER(S)
PROJ. LEADER
MFG.

MATERIAL
SEE BOM
919-0600
FINISH
NEXT ASSY.

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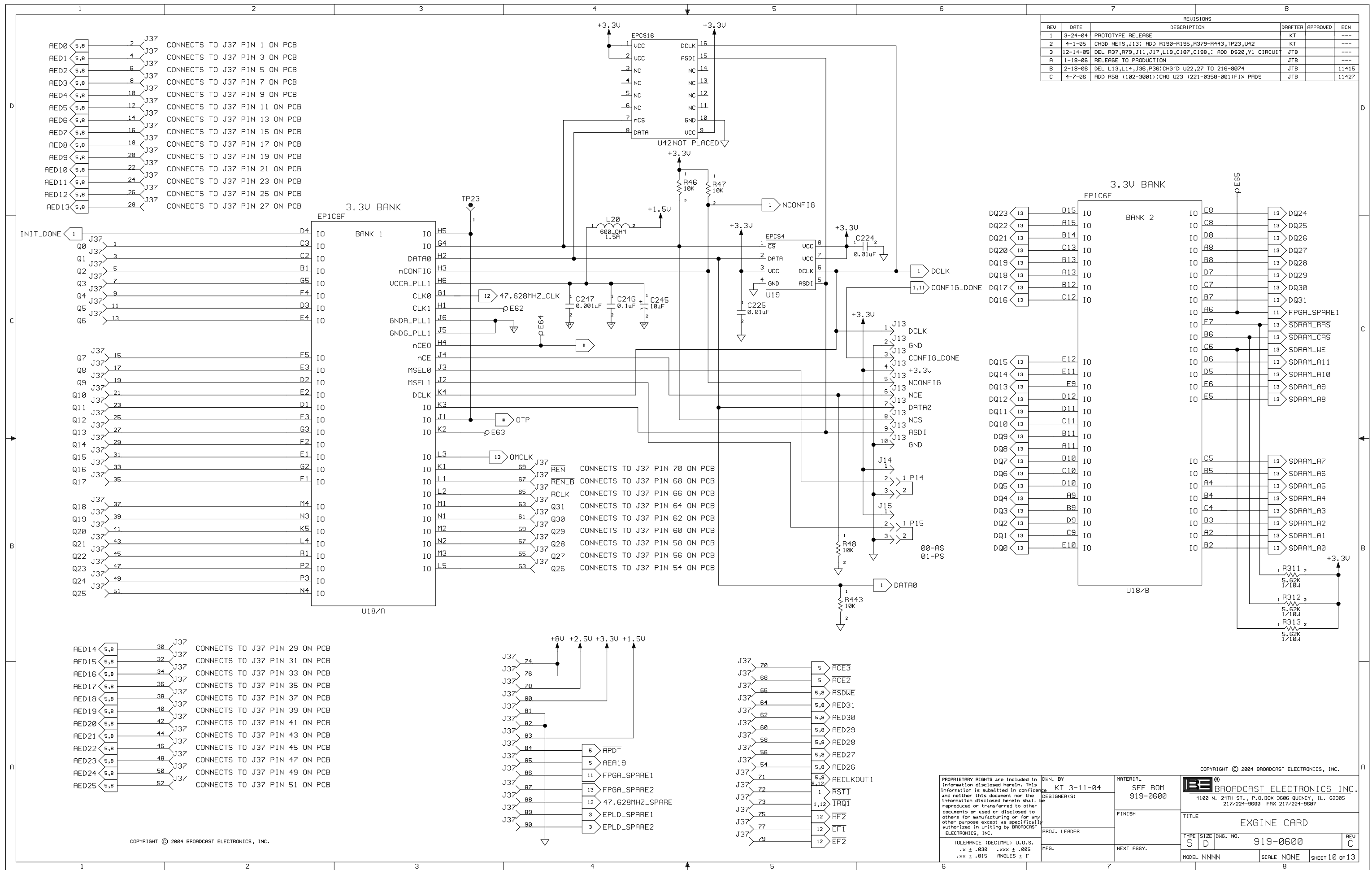
BROADCAST ELECTRONICS INC.
4100 N. 24TH ST., P.O. BOX 3606 QUINCY, IL. 62305
217/224-9600 FAX 217/224-9607

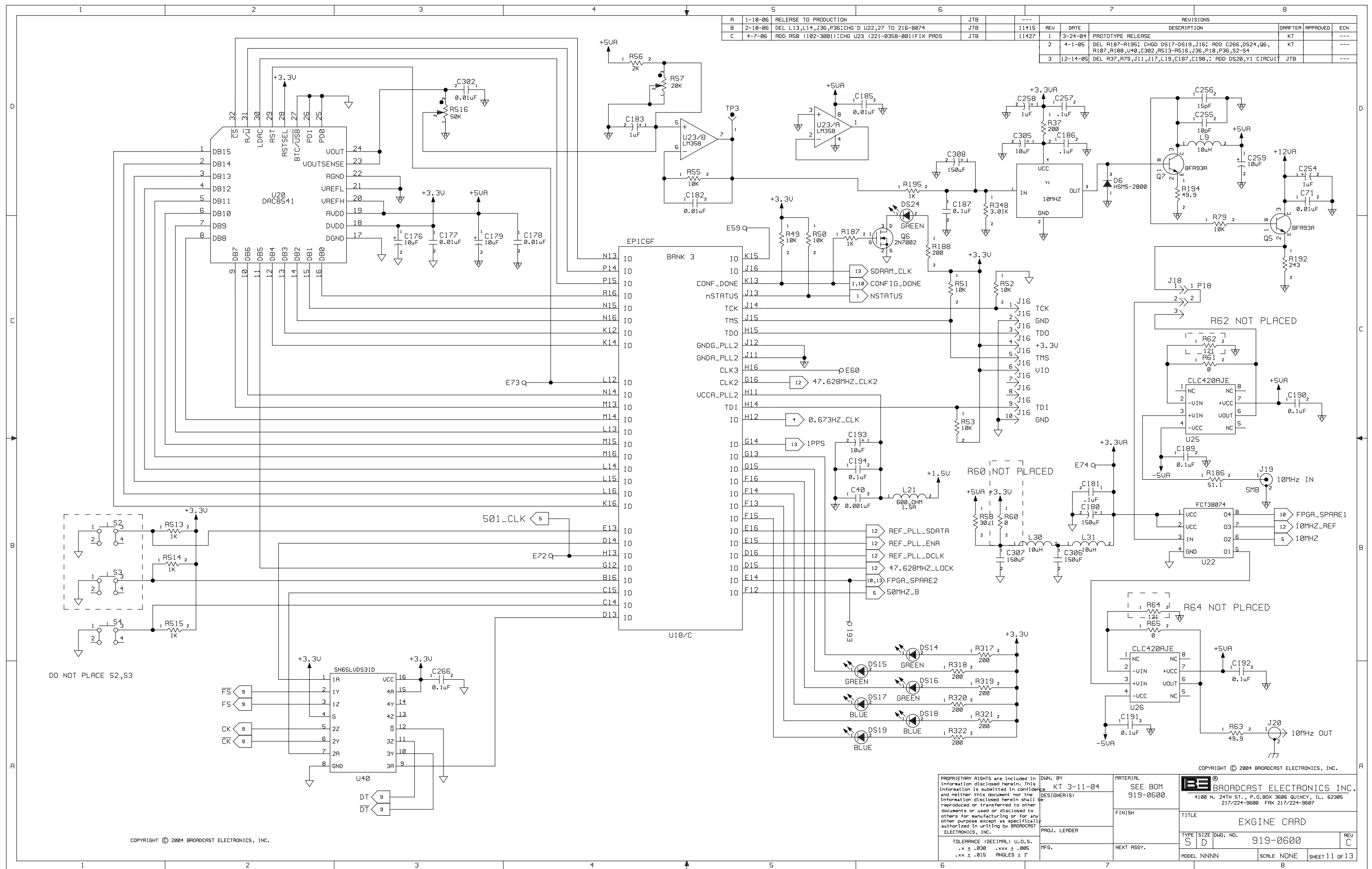
TITLE
EXGINE CARD

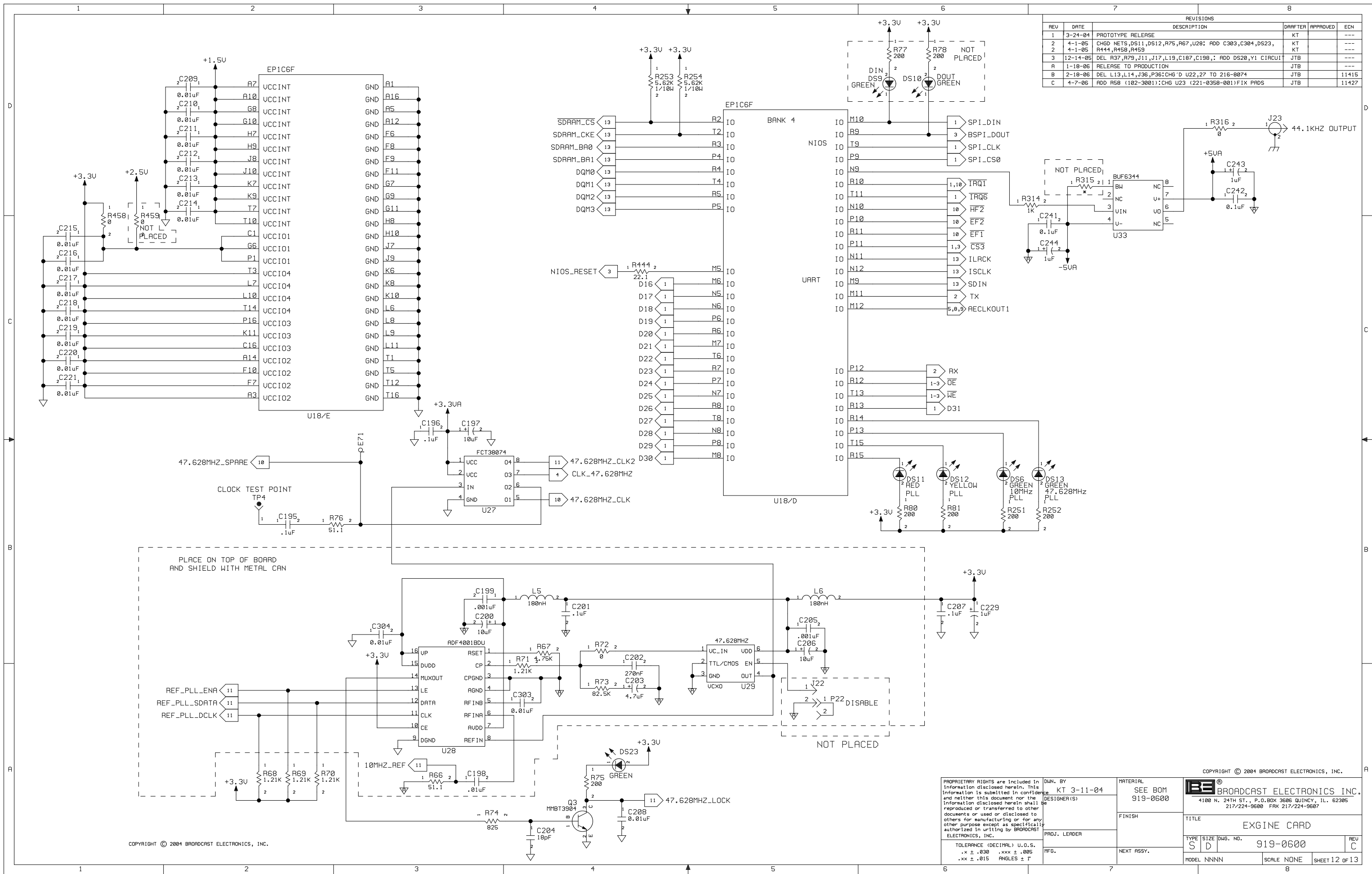
TYPE SIZE DWG. NO.
S D 919-0600

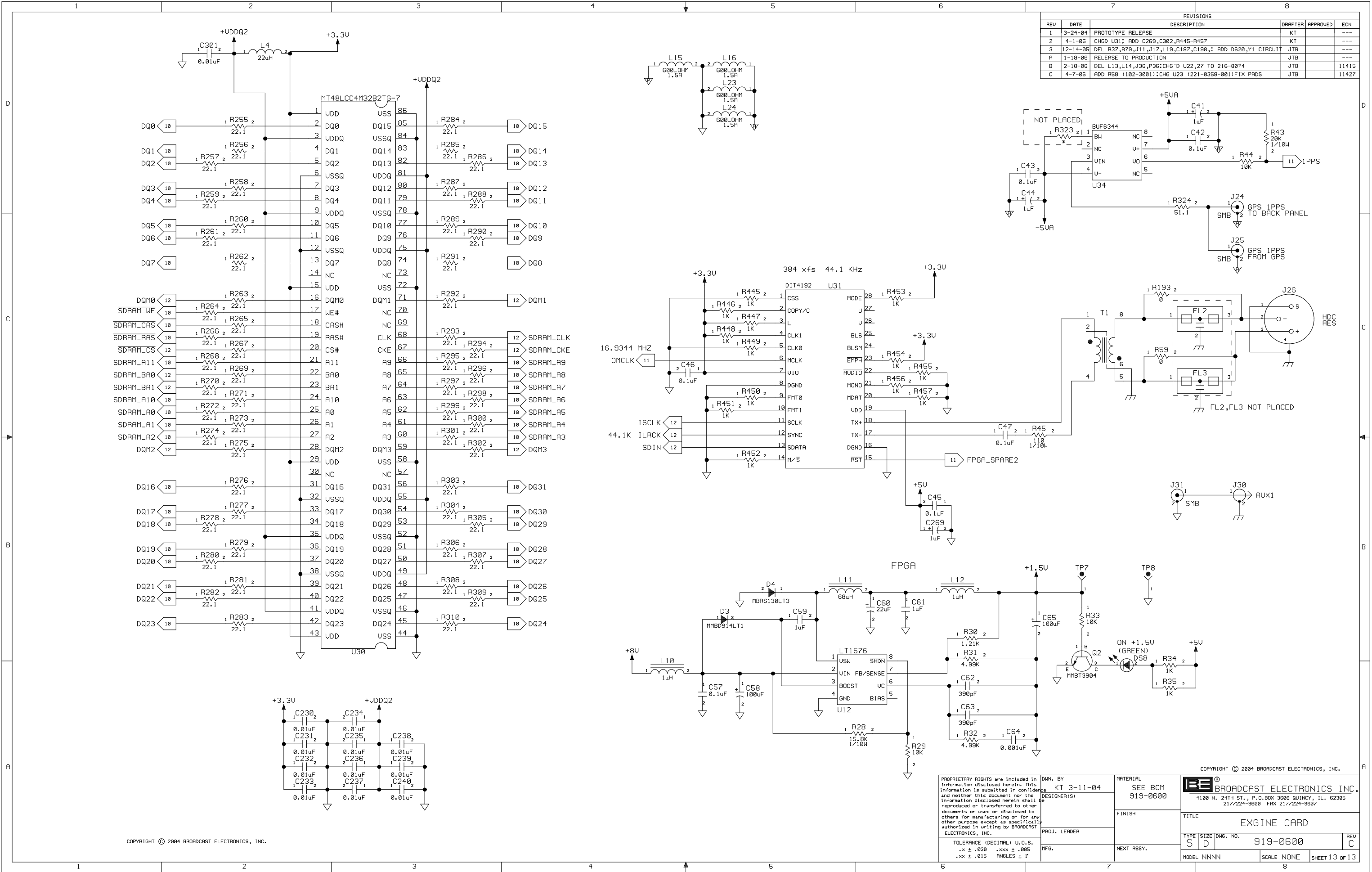
MODEL NNNN SCALE NONE SHEET 9 OF 13

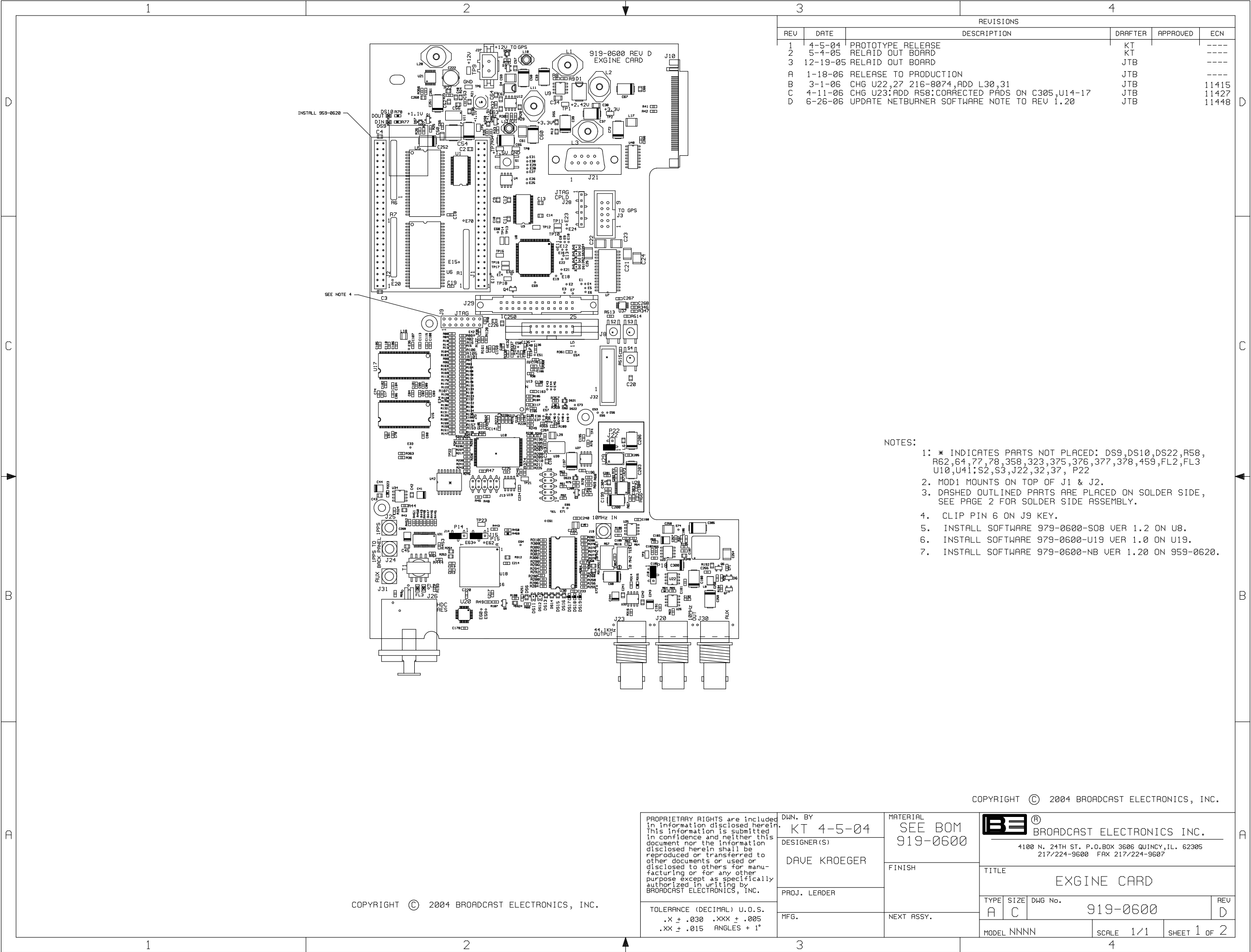
REV
C

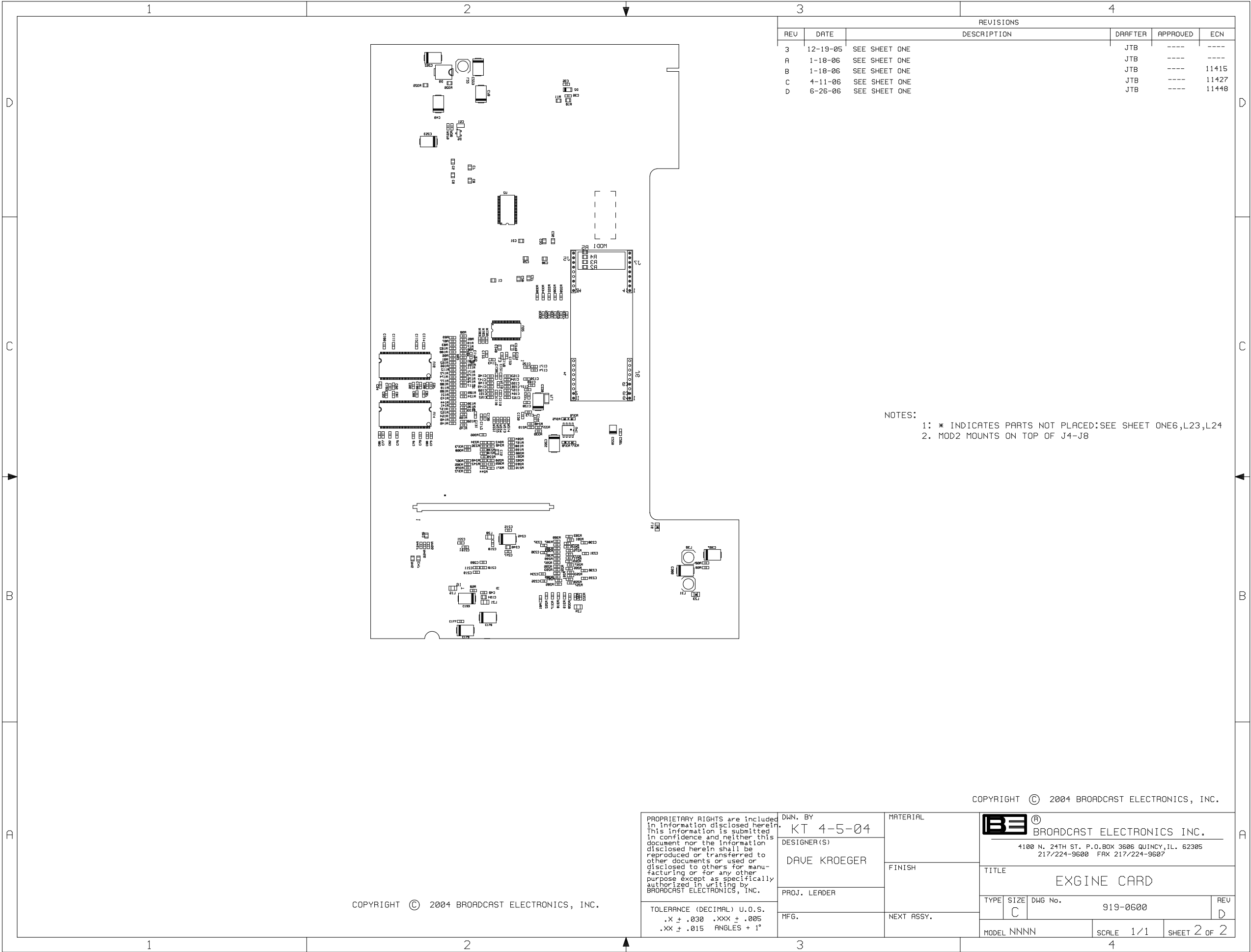












REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
3	12-19-05	SEE SHEET ONE	JTB	----	----
A	1-18-06	SEE SHEET ONE	JTB	----	----
B	1-18-06	SEE SHEET ONE	JTB	----	11415
C	4-11-06	SEE SHEET ONE	JTB	----	11427
D	6-26-06	SEE SHEET ONE	JTB	----	11448

- NOTES:
- 1: * INDICATES PARTS NOT PLACED:SEE SHEET ONE6,L23,L24
 - 2. MOD2 MOUNTS ON TOP OF J4-J8

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TOLERANCE (DECIMAL) U.O.S.
.X ± .030 .XXX ± .005
.XX ± .015 ANGLES + 1°

DWN. BY
KT 4-5-04
DESIGNER(S)
DAVE KROEGER
PROJ. LEADER
MFG.

MATERIAL
FINISH
NEXT ASSY.

BE® BROADCAST ELECTRONICS INC.
4100 N. 24TH ST. P.O.BOX 3606 QUINCY,IL. 62305
217/224-9600 FAX 217/224-9607

TITLE
EXGINE CARD

TYPE	SIZE	DWG No.	919-0600	REV	D
MODEL NNNN		SCALE	1/1	SHEET 2 OF 2	